SOIL SURVEY OF

Bryan and Chatham Counties, Georgia

United States Department of Agriculture
Soil Conservation Service
In cooperation with
University of Georgia, College of Agriculture
Agricultural Experiment Stations

Issued March 1974

Major fieldwork for this soil survey was done in the period 1963–68. Soil names and descriptions were approved in 1969. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1968. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Coastal Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Bryan and Chatham Counties are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those that have a moderate limitation can be colored yellow, and those that have a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the section "Use of the Soils for Cultivated Crops and Pasture."

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped in a table according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Town and Country Planning."

Engineers and builders can find, under "Uses of the Soils in Engineering," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Bryan and Chatham Counties may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the counties given in the section "Additional Facts About the Counties."

Cover picture: **Small farms about 5 miles south of Richmond Hill in Bryan County.**

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE, AGRICULTURAL EXPERIMENT STATIONS

BRYAN AND CHATHAM COUNTIES are in the eastern corner of Georgia (fig. 1), within the Atlantic Coast Flatwoods section of the State. The counties adjoin and have a total land area of 880 square miles or 563,200 acres. Bryan County has a land area of 439 square miles, or 280,960 acres, and Chatham County has a land area of 441 square miles, or 282,240 acres. The Savannah River forms the northeastern boundary of Chatham County, and the Atlantic Ocean forms the eastern boundary. Bryan and Chatham Counties are separated by the Ogeechee River. Savannah is the population center for the eastern part of the State and is an important seaport for the Southeast.

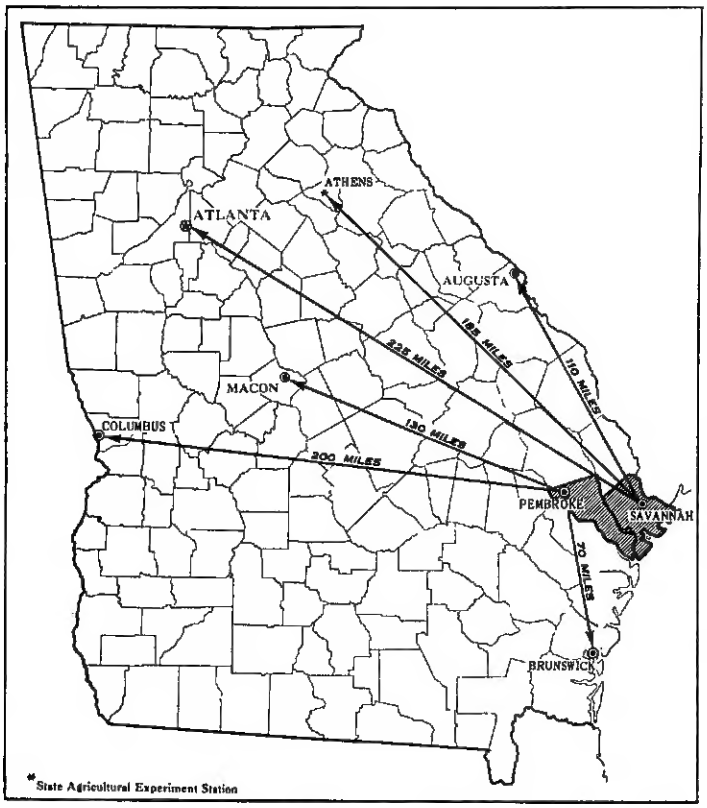

Figure 1. Location of Bryan and Chatham Counties in Georgia.

A group of English under General James Oglethorpe settled in Savannah in 1733. Migration moved westward after the coastal area was settled. According to the U.S. Bureau of Census, in 1960 the population of Chatham County was 188,299 and Bryan County was 6,226. Savannah, Chatham County seat, had a population of 149,245. The county seat of Bryan County is Pembroke and its 1960 population was 1,450. The population in cities and towns is increasing, but the farm population is decreasing. In 1959, the average size of farms in Bryan County was about 204 acres and in Chatham County it was about 258 acres. In 1964 the average size of farms was about 233 acres in Bryan County and 207 acres in Chatham County. In that year about 12.5 percent of Bryan County was in farms and about 17 percent of Chatham County.

The major soils chiefly have a sandy surface layer over a loamy or sandy subsoil or underlying layers. These soils are mainly nearly level or gently sloping and occur as broad, smooth areas drained by wet depressions. They generally are seasonally wet or almost always wet, except for the better drained soils on the slight ridges and dunelike relief. A band of marshland parallels the coastline and extends inland along the major streams. Marshland makes up about 22 percent of the total acreage of these two counties.

About 65 percent of the survey area is in woodland and is held in large tracts by pulp and paper companies and the Fort Stewart Military Reservation. The warm humid climate and high water table promote rapid tree growth. The wood products harvested from the forest and the many industries around Savannah are the chief sources of income.

Local markets are available for all locally and regionally produced crops.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Bryan and Chatham Counties, where they are located, and how they can be used. The soil scientists went into the counties knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native

plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Pooler and Ogeechee, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Lucy loamy sand, 5 to 12 percent slopes, is a phase within the Lucy series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Bryan and Chatham Counties: soil complexes and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Kershaw-Osier complex is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Angelina and Bibb soils, frequently flooded, is an example.

In most areas surveyed there are places where the soil material is so sandy, so shallow, or so altered that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Coastal beach is a land type in Bryan and Chatham Counties.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Bryan and Chatham Counties. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in Bryan and Chatham Counties have been placed in five main groups: Four associations consist of sandy soils; three consist of seasonally wet soils that have loamy underlying layers; two consist of wet soils that have loamy underlying layers; one consists of wet soils that have clayey underlying layers; and three consist of wet soils that have loamy to clayey underlying layers and are frequently flooded.

Areas Dominated by Sandy Soils

In four soil associations, the soils are mainly nearly level to sloping and occur on beaches, on ridges that are dunelike, on broad, low, sandy ridges, and in wet depressions. Slopes generally range from 0 to about 10 percent. In places slopes are short and are as steep as about 20 percent. The soils are mainly excessively drained to moderately well drained, but in depressions they are poorly drained. Most of the soils are sandy to a depth of 60 inches, but Ellabelle soils are medium textured below a depth of about 22 inches.

1. Kershaw-Osier-Coastal beach association

Coastal beaches and excessively drained and poorly drained soils that are sandy throughout; on narrow ridges, on dunes, and in depressions

This association occurs on the coastal barrier islands in the eastern part of Chatham County. It consists of beaches bordering the Atlantic Ocean and narrow, sharp ridges that begin just west of the beaches. The ridge and dune crests and the valleys are narrow, and the long axis of the ridges and dunes is parallel to the beach. The beaches slope toward the ocean and are flooded twice daily by the tide. The slopes of the ridges and dunes range from 2 to about 20 percent. The steeper slopes are on the west side.

This association occupies about 1 percent of the survey area. It is about 45 percent Kershaw soils, 30 percent Osier soils, and 18 percent Coastal beach. Minor soils make up the remaining 7 percent.

Kershaw soils are excessively drained and occur on ridges. Typically, the surface layer is very dark grayish-brown fine sand 3 inches thick. It is underlain by loose fine sand that extends to a depth of more than 10 feet. The fine sand is light yellowish brown, brownish yellow, and pale yellow.

Osier soils occur between the ridges and are poorly drained. Typically, the surface layer is very dark gray fine sand about 4 inches thick. Below this layer, to a depth of 60 inches, is fine sand. It is light brownish gray in the upper part, mottled light gray in the middle, and greenish gray in the lower part.

Coastal beach has a total length of about 22 miles in this association. It is gray fine sand that has varying amounts of shell fragments and is mildly alkaline in reaction.

Minor soils and a land type in this association are the sandy Chipley soils and Tidal marsh.

Currents adjacent to the beaches move mainly southward and continually erode the beaches, especially at the north end of the islands. The erosion is accelerated by northeast winds (fig. 2). The prevailing easterly shore winds gradually build up the dunes immediately adjacent to the beaches. These dunes and the ridges normally are stabilized by grasses and small woody plants next to the beaches. Farther west, forest-type trees grow, chiefly live oak, cabbage palmetto, loblolly pine, and cedar.

All of this association, except for Tybee Island, is remote and has not been developed. Tybee Island was developed as a summer resort more than a half century ago and is densely populated during the summer by residents and visitors (fig. 3).

This association is not suitable for farming. The undeveloped areas have a potential for resort and recreational development. The major limitations for residential development of the association are the uneven topography of Kershaw soils and the wetness of Osier soils.

2. Lakeland-Chipley association

Excessively drained to moderately well drained soils that are sandy throughout; on broad ridges

This soil association occurs mainly on the higher areas of the islands, in the eastern part of Chatham County, and in the western half of Bryan County. On the islands and in the eastern part of Chatham County, it is adjacent to the marshes but is separated from them by a short bluff. Slopes inland to lower lying areas are about 1 percent (fig. 4). In the western half of Bryan County, the association occurs as broad sandy areas more than 70 feet above sea level. In this locality, most slopes range from about 0 to 4 percent, but in a few undulating areas slopes are as much as 10 percent.

This association makes up about 6 percent of the survey area. About 60 percent of this is Lakeland soils, and 20 percent is Chipley soils. Minor soils make up the remaining 20 percent.

The excessively drained Lakeland soils are on the higher ridges. Typically, they have a surface layer of very dark grayish-brown sand about 8 inches thick. Below the surface layer, to a depth of 72 inches, is yellowish-brown to pale-olive sand. In places small yellowish-red iron concretions are below the surface at varying depths.

Chipley soils are moderately well drained. Typically, the surface layer is very dark grayish-brown fine sand about 7 inches thick. Under this, to a depth of about 65 inches, is an olive-brown sandy layer that grades into mottled light olive-brown and light yellowish-brown fine sand.

Minor soils in this association are chiefly the wet Ellabelle soils in the depressions and Leon soils on the low flats.

Most of the acreage of this association around Savannah has been developed for community and industrial use. Areas on the islands and in Bryan County are mostly wooded, and the native vegetation is chiefly longleaf pine, slash pine, and small oaks. The native vegetation in the eastern part of Bryan County is mixed loblolly pine, live oak, red oak, and cabbage palmetto, and the understory is waxmyrtle and yaupon in places.

The major soils of this association have mainly slight to moderate limitations for community development. They are not well suited to farming. During dry periods, the better drained soils are droughty.

Figure 2.—Trees undermined by erosion. Coastal beach is in the foreground, and Kershaw-Osier complex is in the background.

3. *Chipley-Leon-Ellabelle association*

Moderately well drained and poorly drained soils that are sandy throughout, on broad, low ridges; and very poorly drained soils that have loamy underlying layers, in depressions and drainageways

This association occurs on broad, low sand ridges that have depressions or bays. Between the low ridges are drainageways that generally extend northeast and southwest. Slopes are 0 to 5 percent, though slopes are less than 2 percent in most areas. The seasonal high water table is at or near the surface in the depressions, bays, and drainageways and is a few inches to 2 feet below the surface on the low ridges.

This association makes up about 6 percent of the survey area. About 30 percent of this is Chipley soils, 25 percent is Leon soils, and 20 percent is Ellabelle soils. Minor soils make up the remaining 25 percent.

Chipley soils are moderately well drained. Locally, they are very gently sloping to nearly level. Typically, the surface layer is very dark grayish-brown fine sand about 7 inches thick. Under this, to a depth of about 65 inches, is an olive-brown sandy layer that grades into mottled light olive-brown and light yellowish-brown fine sand.

Leon soils are poorly drained and nearly level. Typically, the surface layer is black fine sand about 6 inches thick. A leached, light-gray fine sand layer, about 6 inches thick, overlies a layer that is stained with organic matter and is about 7 inches thick. This stained layer is dark reddish-brown sandy material that in most places is weakly cemented, slightly hard when dry, and friable when moist. Below this layer, to a depth of 60 inches, is mainly fine sand. It is grayish brown in the upper part, light gray in the middle, and dark gray in the lower part.

Figure 3.—Kershaw-Osier-Coastal beach association on Tybee Island is used mostly for recreation.

Figure 4.—Lakeland-Chipley association bordering a tidal stream. Marsh is in the foreground.

Ellabelle soils are very poorly drained and occur in depressions and drainageways. The depressions are ponded, and the drainageways lack well-defined natural channels. Typically, the surface layer is black loamy sand about 11 inches thick. Below the surface layer is light brownish-gray loamy sand about 11 inches thick. It is underlain by gray sandy clay loam that extends to a depth of about 60 inches. The sandy clay loam is mottled with yellowish brown and strong brown in the upper part and yellowish brown in the lower part.

Minor soils in the association are the poorly drained Olustee soils, the somewhat poorly drained Ocilla soils, and the poorly drained Pelham soils.

Most of the acreage of this association around Savannah has been developed for community and industrial uses. The other areas are still wooded. The vegetation on the low ridges is mostly loblolly pine, slash pine, live oak, and southern red oak. An understory of waxmyrtle or yaupon is on the higher areas. Next to the ponds, drainageways, and bays, the understory is saw-palmetto and cudjoe wood. In the very wet areas, the vegetation is chiefly blackgum, cypress, sweetgum, and water oaks. Some of the intermittent ponds have a sparse tree canopy and a ground cover of sawgrass.

This association is not well suited to farming. The wetter soils have severe limitations for most nonfarm uses. The moderately well drained soils generally have moderate limitations for nonfarm uses.

4. Kershaw-Chipley-Ellabelle association

Excessively drained to moderately well drained sandy soils, on ridges; and very poorly drained soils that have loamy underlying layers, in depressions along the Ogeechee and Canoochee Rivers

This association occurs as a series of sand ridges and depressions parallel to and on the north side of the Ogeechee and Canoochee Rivers. The ridges are typically long and narrow, the long axis extending in a northwest-

southeast direction. Each area is made up mainly of two parallel ridges separated by a drainageway or depression. Slopes range from about 2 to 8 percent.

This association makes up about 3 percent of the survey area. About 40 percent of this is Kershaw soils, 25 percent is Chipley soils, and 20 percent is Ellabelle soils. Minor soils make up the remaining 15 percent.

Kershaw soils occur on the ridges and are excessively drained. Typically, they have a very dark grayish-brown coarse sand surface layer 3 inches thick. It is underlain by loose coarse sand that extends to a depth of more than 10 feet. It is light yellowish brown, brownish yellow, and pale yellow in the upper part and strong brown in the lower part.

Chipley soils are very gently sloping to nearly level. They are moderately well drained. Typically, the surface layer is very dark grayish-brown fine sand about 7 inches thick. Under this, to a depth of about 65 inches, is an olive-brown sandy layer that grades into mottled light olive-brown and light yellowish-brown fine sand.

Ellabelle soils are very poorly drained and occur in the depressions and drainageways. Typically, the surface layer is black loamy sand about 11 inches thick. Below the surface layer is light brownish-gray loamy sand about 11 inches thick. It is underlain by gray sandy clay loam that extends to a depth of about 60 inches. The sandy clay loam is mottled with yellowish brown and strong brown in the upper part and yellowish brown in the lower part.

Minor soils in the association are the sandy, poorly drained Leon soils, the sandy, excessively drained Lakeland soils, and the poorly drained Pelham soils.

Almost all of the association is wooded with a sparse, mixed stand of longleaf pine and turkey oak. The understory is saw-palmetto and wiregrass. The vegetation in the drains and depressions is mixed cypress, blackgum, and titi.

This association is not well suited to farming. In most areas the soils have moderate limitations for nonfarm uses, but in the depressions or drainageways, limitations are severe. These soils are a probable source of certain kinds of construction sand.

Areas Dominated by Seasonally Wet Soils That Have Loamy Underlying Layers

In three soil associations, the soils are mainly nearly level and occur as low ridges and depressions that parallel broad drainageways. Slopes generally range from 0 to about 5 percent, but short slopes of as much as 20 percent occur in places. The soils are well drained to somewhat poorly drained on the ridges and poorly drained or very poorly drained in the depressions. Most of the soils are loamy sand to a depth of 2 to 3 feet and sandy clay loam below.

5. Ocilla-Pelham-Albany association

Somewhat poorly drained soils on low ridges; and in depressions, poorly drained soils that have a sandy surface layer and loamy underlying layers

This association occurs as isolated ridges that are between 15 and 30 feet above sea level and are mostly in a broad belt through the central part of the survey area. The areas are surrounded by drainageways and flats, and the local relief ranges from about 2 to 10 feet. Slopes range from about 5 percent on the few sloping areas to less than 1 percent on the more nearly level areas.

This association makes up about 12 percent of the survey area. About 50 percent of this is Ocilla soils, 13 percent is Pelham soils, and 13 percent is Albany soils. Minor soils make up the remaining 24 percent.

The somewhat poorly drained Ocilla soils occur on the low ridges. Typically, the surface layer is very dark gray loamy fine sand about 6 inches thick. It is underlain by about 16 inches of loamy fine sand and fine sand that is grayish brown in the upper part and pale olive in the lower part. Below this layer, to a depth of about 60 inches, is sandy clay loam. It is light olive brown mottled with shades of gray and brown in the upper part and light brownish gray mottled with shades of brown and red in the lower part.

The poorly drained Pelham soils occur in the depressions. Typically, the surface layer is very dark gray loamy sand about 7 inches thick. It is underlain by about 17 inches of dark-gray and gray loamy sand. The next layer extends to a depth of about 60 inches and is mainly sandy clay and sandy clay loam. It is light gray in the upper part and gray mottled with brownish yellow and light olive brown in the lower part.

Albany soils are somewhat poorly drained and occur on the low ridges. Typically, these soils are sandy to a depth of about 42 inches. The surface layer is very dark gray fine sand about 7 inches thick. Mainly fine sand is below this layer, and it extends to a depth of 42 inches. It is light olive brown in the upper part and light gray and light yellowish brown mottled with shades of gray and brown in the lower part. Below this layer, to a depth of 68 inches, is brownish-yellow and light-gray sandy clay loam mottled with shades of gray, brown, and yellow.

Minor soils in the association are the somewhat poorly drained Ogeechee soils, the very poorly drained Ellabelle soils in the depressions, and the moderately well drained Craven soils on the ridges.

About 60 percent of the association was cleared and cultivated, but only a small percentage is now cultivated. Most of the farming in Chatham County is on this association. The native vegetation is mainly mixed loblolly pines, red oak, hickory, and live oak and an understory of waxmyrtle. If moderate water control measures are used, the better drained areas are well suited to truck crops. All of the acreage is well suited to loblolly and slash pines.

For nonfarm uses, the soils on the ridges have moderate limitations and the soils in depressions and drainageways have severe limitations.

6. Stilson-Fuquay-Pelham association

Well drained to moderately well drained soils on ridges; and in drainageways, poorly drained soils that have a sandy surface layer and loamy underlying layers

This association occurs in the northernmost part of Bryan County near Eldora. On the ridgetops the soils are nearly level. The drainageways extend west up to the ridge crest. Slopes are mainly 0 to 5 percent. This association is separated from the Ogeechee River flood plain by short slopes of 10 to 20 percent.

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This association makes up about 1 percent of the survey area. About 55 percent of this is Stilson soils, 25 percent is Fuquay soils, and 15 percent is Pelham soils. Minor soils make up the remaining 5 percent.

The moderately well drained Stilson soils occur on the ridges. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. It is underlain by about 19 inches of loamy sand that is olive in the upper part and light yellowish brown in the lower part. Below this layer, to a depth of 60 inches, is sandy loam and sandy clay loam. It is olive yellow in the upper part and pale brown in the lower part, and it is mottled with shades of brown, gray, olive, and red.

Fuquay soils are well drained and occupy the ridge crest. Typically, the surface layer is dark grayish-brown loamy sand about 7 inches thick. It is underlain by yellowish-brown loamy sand about 17 inches thick. Mainly sandy clay loam is below this layer, and it extends to a depth of about 70 inches. It is yellowish brown in the upper part and yellowish brown mottled with strong brown, light gray, and red in the lower part. The next layer extends to a depth of 80 inches and is sandy clay loam mottled with shades of gray, red, and brown. Plinthite makes up more than 5 percent of some layers between depths of 34 and 60 inches.

The poorly drained Pelham soils occupy the drainageways. Typically, the surface layer is very dark gray loamy sand about 7 inches thick. It is underlain by about 17 inches of dark-gray and gray loamy sand. The next layer, to a depth of about 60 inches, is mainly sandy clay and sandy clay loam. It is light gray in the upper part and gray mottled with brownish yellow and light olive brown in the lower part.

Minor soils in the association are the well-drained Dothan and Lucy soils and the very poorly drained Ellabelle soils.

Except for the wet areas, almost all of this association has been cleared and cultivated. About 40 percent of the association is now cultivated or in pasture. The remaining acreage is wooded chiefly with slash or longleaf pine and has an understory of gallberry bushes. Except for the wet areas, the soils have a wide range of suitable uses and are suited to all locally adapted crops. The wet areas have a high site index for slash pine.

The soils in most of the association have slight to moderate limitations for most nonfarm uses, but the wet areas, mainly Pelham soils, have severe limitations.

7. Stilson-Pelham-Albany association

Moderately well drained to somewhat poorly drained soils on ridges; and in depressions and drainageways, poorly drained soils that have a sandy surface layer and loamy underlying layers

This association occurs in the western and central parts of Bryan County. It is more than 70 feet above sea level. The soils are nearly level to very gently sloping on the ridge crest. Differences in local relief range from about 2 to 10 feet between the ridge crest and drainageways. In most areas slopes are 2 percent or less.

This association occupies about 10 percent of the survey areas. About 43 percent of this is Stilson soils, 25 percent Pelham soils, and 10 percent Albany soils. Minor soils make up the remaining 22 percent.

Stilson soils occur on the higher ridges and are moderately well drained. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. It is underlain by about 19 inches of loamy sand that is olive in the upper part and light yellowish brown in the lower part. Below this layer, and extending to a depth of 60 inches, is sandy loam and sandy clay loam. It is olive yellow in the upper part and pale brown in the lower part, and it is mottled with shades of brown, gray, olive, and red.

Pelham soils occupy depressions and drainageways and are poorly drained. Typically, the surface layer is very dark gray loamy sand about 7 inches thick. It is underlain by about 17 inches of dark-gray and gray loamy sand. The next layer, to a depth of about 60 inches, is mainly sandy clay and sandy clay loam. It is light gray in the upper part and gray mottled with brownish yellow and light olive brown in the lower part.

Albany soils occur on the low ridges and are somewhat poorly drained. Typically, these soils are sandy to a depth of about 42 inches. The surface layer is very dark gray fine sand about 7 inches thick. Below the surface layer, to a depth of 42 inches, is mainly fine sand. It is light olive brown in the upper part and light gray and light yellowish brown mottled with shades of gray and brown in the lower part. Below this layer, to a depth of 68 inches, is brownish-yellow and light-gray sandy clay loam mottled with shades of gray, brown, and yellow.

Minor soils in this association are the poorly drained Mascotte and Olustee soils and the very poorly drained Ellabelle soils.

Most of the acreage is wooded, but most of the cultivated land in Bryan County occurs in this association. About 30 percent of the association is cultivated or in pasture.

If water control measures are moderate, the soils in the better drained areas are well suited to most locally adapted crops. The soils in all of the association are well suited to slash pine. Except for some wet areas, the limitations for nonfarm uses are moderate. Limitations are severe in the drainageways and depressions.

Areas Dominated by Wet Soils That Have Loamy Underlying Layers

The soils in two associations are nearly level and occur on broad flats, in depressions, and in drainageways. Slopes are 2 percent or less. These soils are very poorly drained to somewhat poorly drained. They are mainly gray mottled with shades of yellow and brown. The surface layer is chiefly loamy sand and sand, and the underlying layers are sandy clay loam.

8. Ellabelle-Pelham association

Very poorly drained and poorly drained soils that have a thick sandy surface layer over loamy underlying layers; on broad flats and in drainageways

This soil association occurs only in the western part of Bryan County. It is characterized by broad, level to nearly level flats and very slight local relief. The drainageways have a gradient of less than 2 feet per mile. Elevations are more than 70 feet.

This association makes up about 5 percent of the survey area. About 60 percent of this is Ellabelle soils, and

15 percent is Pelham soils. Minor soils make up the remaining 25 percent.

Ellabelle soils are very poorly drained. They have a surface layer of black loamy sand about 11 inches thick. Below the surface layer is light brownish-gray loamy sand about 11 inches thick. It is underlain, to a depth of about 60 inches, by gray sandy clay loam. This layer is mottled with yellowish brown and strong brown in the upper part and yellowish brown in the lower part. These soils have a seasonal high water table, and they are flooded for extended periods at times.

Pelham soils are poorly drained. They have a surface layer of very dark gray loamy sand about 7 inches thick. It is underlain by about 17 inches of dark-gray and gray loamy sand. The next layer, to a depth of about 60 inches, is mainly sandy clay and sandy clay loam. It is light gray in the upper part and gray mottled with brownish yellow and light olive brown in the lower part. These soils have a seasonal high water table that is near the surface for long periods.

The minor soils are chiefly the poorly drained Mascotte soils.

Most of the acreage is wooded with mixed stands of hardwoods and slash pine. In a few areas the trees are dominantly sweetgum, cypress, and blackgum. The frequent flooding and wetness severely limit the use of the soils in this association for purposes other than woodland.

The major soils in this association have severe limitations for use as residential and industrial sites and for similar nonfarm uses.

9. Ogeechee-Ellabelle association

Somewhat poorly drained and very poorly drained soils that have a sandy surface layer over loamy underlying layers; mainly on broad flats

This association is made up of broad flats about 6 to 25 feet above sea level. The areas occur in the western half of Chatham County and the eastern and central parts of Bryan County. Local relief is normally less than 2 feet per mile. The seasonal high water table is at a depth of less than 1 foot, and in depressions water covers the surface for periods of 2 to 6 months at times.

This association makes up about 15 percent of the survey area. About 30 percent of this is Ogeechee soils, and 24 percent is Ellabelle soils. Minor soils make up the remaining 46 percent.

Ogeechee soils are somewhat poorly drained. They have a surface layer of very dark gray loamy fine sand about 8 inches thick. Below the surface layer, to a depth of more than 60 inches, is sandy clay loam and sandy clay. It is dark grayish brown in the upper part and grayish brown in the lower part, and it is mottled with shades of brown.

Ellabelle soils are very poorly drained. They have a surface layer of black loamy sand about 11 inches thick. Below the surface layer is light brownish-gray loamy sand about 11 inches thick. It is underlain, to a depth of about 60 inches, by gray sandy clay loam. This layer is mottled with yellowish brown and strong brown in the upper part and yellowish brown in the lower part. Both of the major soils occur on similar parts of the landscape.

Minor soils in this association are the poorly drained Mascotte and Pelham soils and the very poorly drained Cape Fear soils.

Most of the acreage in this association is wooded, but a small acreage at Bloomingdale and Pooler has been developed for community use. A small part is used for pasture. The native vegetation is chiefly loblolly pine. Scattered blackgum and sweetgum trees grow, and in the depressions, the vegetation is chiefly cypress and blackgum. Except in the ponded areas, an understory of wiregrass and scattered waxmyrtle or sweetbay is common.

Because the soils of this association are wet, they are poorly suited to farming. They are suited to trees.

The association has severe limitations for residential sites and other nonfarm uses.

Areas Dominated by Wet Soils That Have Clayey Underlying Layers

The soils in one association are nearly level and occur mainly in low-lying areas and depressions. Slopes range from 0 to about 2 percent. These soils are somewhat poorly drained and very poorly drained. They have a very dark gray loamy surface layer and mainly a gray, mottled, clayey underlying layer.

10. Pooler-Cape Fear association

Somewhat poorly drained and very poorly drained soils that have a clayey underlying layer; in low-lying areas and depressions

This association is made up of inland flats in the western part of Chatham County and the central part of Bryan County. Local relief is normally less than 1 foot per mile, and the drainageways are poorly defined. The seasonal high water table is at or near the surface for long periods, and the depressions and drainageways are subject to flooding for periods of 2 to 6 months.

This association makes up about 4 percent of the survey area. About 36 percent of this is Pooler soils, and 35 percent is Cape Fear soils. Minor soils make up the remaining 29 percent.

Pooler soils are somewhat poorly drained and occur in low-lying areas. Typically, the surface layer is very dark gray fine sandy loam about 5 inches thick. Mainly clay is below the surface layer and extends to a depth of about 60 inches. It is grayish brown in the upper part and light brownish gray and light olive brown in the lower part, and it is mottled with shades of red, brown, and gray.

Cape Fear soils are very poorly drained and occur in depressions and drainageways. Typically, the surface layer is very dark gray clay loam about 10 inches thick. Below the surface layer, to a depth of about 72 inches, is dark-gray clay and sandy clay mottled with shades of brown and gray.

Minor soils are mainly the Ogeechee, Wahee, and Ocilla soils, which are somewhat poorly drained.

Most of the acreage of this association is woodland. The vegetation is chiefly mixed stands of loblolly pine, red oak, water oak, and sweetgum, and the understory is waxmyrtle.

Because the soils of this association are wet, they are poorly suited to farming. Woodland is a good use.

The association has severe limitations for nonfarm uses, such as residential sites, industrial sites, and roads.

Areas Dominated by Wet Soils That Have Loamy to Clayey Underlying Layers and Are Frequently Flooded

Three associations in Bryan and Chatham Counties occur on bottom lands, in marshes, or in depressional drainageways. They consist of nearly level soils and are at sea level to a few feet above. These associations occur along the eastern seaboard, along the Canoochee, Ogeechee, and Savannah Rivers, and in the drainageways of major creeks. The soils are chiefly gray, have a loamy surface layer, and have loamy to clayey underlying layers.

11. Ellabelle-Cape Fear association

Very poorly drained soils that have loamy and clayey underlying layers; on creek flood plains and in drainageways that are frequently flooded

This association occurs on flood plains of the minor streams in the western half of Chatham County and the central and southern parts of Bryan County. Slopes are generally less than 2 percent, and runoff from higher soils passes over the soils of this association before reaching major streams. Elevation ranges from 6 to 20 feet above sea level.

This association makes up about 12 percent of Bryan and Chatham Counties. About 45 percent of this is Ellabelle soils, and 40 percent is Cape Fear soils. Minor soils make up the remaining 15 percent.

The major soils are very poorly drained and occur on similar parts of the landscape. Ellabelle soils have a surface layer of black loamy sand about 11 inches thick. Below the surface layer is light brownish-gray loamy sand about 11 inches thick. It is underlain by gray sandy clay loam that extends to a depth of about 60 inches. This layer is mottled with yellowish brown and strong brown in the upper part and yellowish brown in the lower part.

Cape Fear soils have a very dark gray clay loam surface layer about 10 inches thick. Below the surface layer, to a depth of 72 inches, is mainly dark-gray clay mottled with shades of brown and gray.

Minor soils are mainly the somewhat poorly drained Ogeechee soils.

All of the acreage in this association is wooded chiefly with hardwoods, such as water oak, willow oak, cypress, blackgum, and sweetgum. A few scattered loblolly pines grow in some places. The frequent flooding, wetness, and clayey underlying layer make it difficult to use conventional equipment for harvesting wood crops.

Because the soils in this association are wet and frequently flooded, they are not suited to farming. Limitations for residential sites, roads, parks, and similar nonfarm uses are severe.

12. Tidal marsh-Capers association

Very poorly drained tidal marshes and soils that have a clayey underlying layer; along the eastern seaboard

This association consists mostly of the marshes in the eastern part of Bryan and Chatham Counties. These marshes are separated from the ocean by barrier islands but form a continuous belt extending from north to south. They are dissected by sounds and tidal streams. To the west, marshes extend up the larger streams and estuaries. The elevation ranges from sea level to about 6 feet; therefore, high tides cover most areas twice daily. Slopes generally are less than 2 percent.

This association makes up about 21 percent of the survey area. About 80 percent of this is Tidal marsh, salty, and about 10 percent is Capers soils. Minor soils make up the remaining 10 percent.

Tidal marsh, salty, is typically high in clay content, but it has some discontinuous masses of sand that vary in size and thickness. The surface layer is high in organic-matter content and in places does not support light loads. The underlying layers are mainly greenish-gray clay.

Capers soils are similar to Tidal marsh, salty, but they occur at slightly higher elevations and are flooded less frequently. The surface layer, high in organic-matter content, is very dark gray clay loam about 8 inches thick. The underlying layer, to a depth of 60 inches, is mainly greenish-gray clay.

The minor part of this association is Tidal marsh, fresh. It is similar to other marshes but is flooded by fresh water rather than by salt water.

A small acreage of the Capers soils and Tidal marsh, fresh, adjacent to the Ogeechee River is being developed for cultivation. Tidal marsh, fresh, along the Savannah River is used as a wildlife refuge. The rest of the association is in its natural state. It has a grass type vegetation that is divided into three main groups. In the lower areas, Tidal marsh, salty, has a cover of smooth cordgrass. Areas of Capers soils that generally are not flooded by normal high tides have a cover that is chiefly black rush or giant cutgrass. Tidal marsh, fresh, is covered chiefly with giant cutgrass and cattails.

The fertility of these soils and land types is very high, but the frequent flooding and unstable conditions limit use for farming, woodland, and nonfarm purposes. Also, the sulfides in Tidal marsh, salty, and in Capers soils, when exposed to air, oxidize to produce acids in quantities that severely restrict or prevent plant growth. This condition presents severe problems in stabilizing dikes with vegetation. The aquatic wildlife of this association is an important source of recreation and income in the area.

13. Angelina-Bibb-Fresh water swamp association

Very poorly drained and poorly drained soils that are loamy throughout; on stream flood plains

This association occurs on the flood plains along major streams and is subject to frequent flooding for long periods in winter and spring. The most eastern parts of the association are affected by tides. Slopes generally are less than 2 percent. The association occurs along the Ogeechee, Canoochee, and Savannah Rivers and, in Bryan County, along Black and Mill Creeks.

This association makes up about 4 percent of the survey area. About 30 percent of this is Angelina soils, 15 percent is Bibb soils, and 15 percent is Fresh water swamp. Minor soils make up the remaining 40 percent.

Angelina soils are very poorly drained. They have a very dark gray loam surface layer about 3 inches thick. The underlying layer ranges from sand to silty clay loam. It is mottled light-gray sand in the upper 11 inches, dark-gray silty clay loam in the next 14 inches, and black loam in the lower 22 inches.

Bibb soils are poorly drained and are frequently flooded. The surface layer is light brownish-gray loamy sand about 18 inches thick. It is underlain by stratified sandy loam, coarse sand, and sand. The stratified layer is mottled light brownish gray in the upper part and light olive gray in the lower part.

Fresh water swamp is a wet, forested, micaceous land type. It consists mainly of mixed mineral sediments and organic matter. Some areas are soft and difficult to travel over. High tides twice daily force streams to reverse their flow and force fresh water over much of the land surface. In places old stream meanders are evident.

Minor soils are chiefly the very poorly drained Johnston and Cape Fear soils.

All of the acreage is wooded. The vegetation is water-tolerant hardwoods, chiefly blackgum, cypress, tupelo, ash, and water oak. The seasonal high water table and frequent flooding are severe limitations for nonfarm uses.

Descriptions of the Soils

This section describes the soil series and mapping units in Bryan and Chatham Counties. Each soil series is described in considerable detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second, detailed and in technical terms, is for scientists, engineers, and others who need to make thorough and precise studies of soils. Unless it is otherwise stated, the colors given in the descriptions are those of a moist soil.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Made land, for example, does not belong to a soil series, but nevertheless is listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland group in which the mapping unit has been placed.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*9*).[1]

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Bryan County	Chatham County	Total	
	Acres	Acres	Percent	Acres
Albany fine sand	11, 520	4, 430	2. 8	15, 950
Angelina and Bibb soils, frequently flooded	14, 760	2, 760	3. 1	17, 520
Cape Fear soils	7, 430	35, 125	7. 6	42, 555
Capers soils	1, 600	11, 850	2. 4	13, 450
Chipley fine sand	9, 910	8, 450	3. 3	18, 360
Chipley-Urban land complex	0	6, 270	1. 1	6, 270
Coastal beach	0	1, 035	. 2	1, 035
Craven loamy fine sand	1, 520	1, 925	. 6	3, 445
Dothan loamy sand	1, 085	0	. 2	1, 085
Ellabelle loamy sand	59, 125	18, 150	13. 7	77, 275
Fresh water swamp	3, 685	0	. 7	3, 685
Fuquay loamy sand	4, 955	0	. 9	4, 955
Johnston loam	2, 020	125	. 4	2, 145
Kershaw coarse sand, 2 to 8 percent slopes	5, 435	935	1. 1	6, 370
Kershaw-Osier complex	0	4, 900	. 9	4, 900
Lakeland sand	12, 570	6, 680	3. 4	19, 250
Leon fine sand	6, 110	4, 090	1. 8	10, 200
Lucy loamy sand, 5 to 12 percent slopes	915	0	. 2	915
Lynn Haven sand	1, 275	430	. 3	1, 705
Made land	0	4, 945	. 9	4, 945
Mascotte sand	14, 325	4, 960	3. 4	19, 285
Meggett loam	375	505	. 2	880
Ocilla complex	13, 605	16, 985	5. 4	30, 590
Ocilla-Urban land complex	0	5, 875	1. 0	5, 875
Ogeechee loamy fine sand	17, 030	14, 800	5. 7	31, 830
Ogeechee-Urban land complex	0	6, 975	1. 2	6, 975
Olustee fine sand	13, 565	3, 305	3. 0	16, 870
Osier fine sand	0	1, 290	. 2	1, 290
Pelham loamy sand	19, 195	9, 105	5. 0	28, 300
Pooler fine sandy loam	3, 280	4, 835	1. 4	8, 115
Stilson loamy sand	27, 365	0	4. 9	27, 365
Tidal marsh, fresh	2, 020	12, 180	2. 5	14, 200
Tidal marsh, salty	19, 805	80, 115	17. 7	99, 920
Wahee sandy loam	6, 480	3, 080	1. 7	9, 560
Wahee-Urban land complex	0	975	. 2	975
City of Savannah	0	5, 155	. 9	5, 155
Total	280, 960	282, 240	100. 0	563, 200

Albany Series

The Albany series consists of slightly undulating, somewhat poorly drained soils. These soils are mainly nearly level, but slopes range to about 5 percent.

In a representative profile, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer is mainly fine sand and extends to a depth of 42 inches. It is light olive brown in the upper part and

[1] Italic numbers in parenthesis refer to Literature Cited, p. 69.

light gray and light yellowish brown mottled with shades of gray and brown in the lower part. The subsoil extends to a depth of 68 inches. It is brownish-yellow and light-gray sandy clay loam mottled with shades of gray, brown, and yellow.

Albany soils have moderate permeability and low available water capacity. The natural fertility and organic-matter content are low. Reaction is very strongly acid throughout.

Albany soils are extensive in Bryan and Chatham Counties. Most of the acreage is wooded. Some areas are used for pasture or are cultivated. The native vegetation is chiefly slash pine and loblolly pine that have an understory of waxmyrtle and gallberries.

Representative profile of Albany fine sand, about 1.2 miles east and south of George Washington Carver School on George Washington Carver School Road, 20 feet west of road, Bryan County:

A1—0 to 7 inches, very dark gray (10YR 3/1) fine sand; weak, fine, granular structure; very friable; many small and large roots; very strongly acid; clear, smooth boundary.

A21—7 to 18 inches, light olive-brown (2.5Y 5/4) fine sand; weak, fine, granular structure; very friable; many small and large roots; very strongly acid; gradual, wavy boundary.

A22—18 to 25 inches, light olive-brown (2.5Y 5/4) fine sand; few, fine, faint, light-gray (2.5Y 7/2) mottles in lower part; single grain; very friable; few small roots; very strongly acid; gradual, wavy boundary.

A23—25 to 32 inches, light-gray (5Y 7/2) fine sand; few, fine, distinct, light yellowish-brown (2.5Y 6/4) mottles; single grain; very friable; few, small roots; very strongly acid; gradual, wavy boundary.

A24—32 to 42 inches, light yellowish-brown (2.5Y 6/4) sand; common, fine, distinct, light-gray (10YR 7/1) mottles and common, fine, prominent, brownish-yellow (10YR 6/8) mottles; single grain; very friable; few small roots; very strongly acid; clear, smooth boundary.

B1t 42 to 48 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, prominent, light-gray (2.5Y 7/2) mottles and few, medium, faint, brownish-yellow (10YR 6/8) mottles; weak, fine, subangular blocky structure; friable to firm; few small roots; very strongly acid; gradual, wavy boundary.

B2tg 48 to 68 inches, light-gray (10YR 7/1) sandy clay loam; many, coarse, prominent, strong brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure; firm; few small roots; very strongly acid.

In most places the A horizon is about 50 inches thick, but it ranges from 42 to 60 inches in thickness. The A1 horizon is very dark gray to olive gray and is generally 7 to 10 inches thick. In places the A2 horizon has mottles with chromas of 2 or less because uncoated sand grains are within 30 inches of the surface. The B horizon is light gray to yellowish brown in the upper part; in places red to brown mottles are in the lower part. The weighted average clay content in the upper 20 inches of the B horizon is about 20 percent in most areas, but it ranges from 18 to 35 percent.

Albany soils are associated with Ocilla, Stilson, Pelham, Ellabelle, and Chipley soils. They are better drained than Ellabelle and Pelham soils, and their surface layer is not so dark. They have a thicker sandy A horizon than Ocilla and Stilson soils. The Albany soils have a fine-textured layer between depths of about 42 and 68 inches, whereas Chipley soils have loamy fine sand or coarser textured material extending to a depth of 6 feet or more.

Albany fine sand (As).—This is the only Albany soil mapped in Bryan and Chatham Counties. It is somewhat poorly drained and occurs in slightly undulating areas. Slopes range from 0 to 5 percent.

Included in mapping are small areas of Stilson, Ocilla, and Pelham soils.

This soil has low natural fertility, but crops respond well to good fertilization. The surface layer has good tilth. The seasonal high water table is about 15 inches below the surface for about 2 months each year and limits the suitability of the soil for some crops. Erosion is not a hazard.

This soil is suited to such crops as corn, soybeans, tobacco, and truck crops, and to such pasture plants as Coastal bermudagrass and bahiagrass. These crops respond well to drainage and to fertilizer and lime. Tile, open ditches, and bedding, leveling, and shaping are suitable for draining this soil. Tile drainage systems require outlets. Drainage is especially desirable where tobacco is grown.

Row crops can be grown continously if management includes adequate fertilization, liming, drainage, and returning plant residue to the soil. An example of a suitable cropping system is 1 year of tobacco followed by 2 years of perennial sod.

Most of the acreage is wooded. A few areas are used for pasture or cultivated crops. Capability unit IIIw–1; woodland group 3w2.

Angelina Series

The Angelina series consists of very poorly drained soils on major stream flood plains that are frequently flooded. These soils formed in recent sediments of Coastal Plain origin. In most areas slopes are less than 2 percent, but some areas have uneven relief caused by cutting and shifting of channels during floods.

In a representative profile, the surface layer is very dark gray loam about 3 inches thick. The underlying layers, to a depth of about 50 inches, consist of about 11 inches of light-gray sand that is mottled with light yellowish brown, 14 inches of dark-gray silty clay loam, and 22 inches of black loam.

Angelina soils are very strongly acid throughout, low to moderate in organic-matter content, and low in natural fertility. Permeability is slow, and the available water capacity is medium.

Most of the acreage occurs along the Ogeechee and Canoochee Rivers and is entirely in forest. The principal trees are cypress, blackgum, sweetgum, red maple, water oak, and tupelo gum.

Representative profile of an Angelina loam, 0.5 mile west of U.S. Highway No. 280 and Mill Creek and 0.3 mile south of U.S. Highway No. 80, 50 feet west of paved county road, Bryan County:

A1—0 to 3 inches, very dark gray (10YR 3/1) loam; weak, fine, granular structure; very friable; many small and large roots; very strongly acid; abrupt, smooth boundary.

C1—3 to 14 inches, light-gray (10YR 7/2) sand; many, coarse, light yellowish-brown (10YR 6/4) mottles; single grain; loose; many small and large roots; very strongly acid; abrupt, smooth boundary.

C2—14 to 28 inches, dark-gray (5Y 4/1) silty clay loam; weak, fine, granular structure; very friable; very strongly acid; gradual, wavy boundary.

C3—28 to 50 inches, black (N 2/0) loam; weak, fine, granular structure; very friable; very strongly acid.

The A horizon ranges from 3 to 8 inches in thickness. It is very dark gray to gray loam, coarse sandy clay loam, or

loamy sand. The subsurface layers vary in thickness. The C horizon is light gray to greenish gray or black. The weighted average clay content between depths of 10 and 40 inches is more than 18 percent and less than 30 percent.

The Angelina soils mapped in these counties differ from typical Angelina soils because they have siliceous rather than mixed mineralogy. They are enough like the Angelina soils in morphology, composition, and behavior that a new series is not warranted.

Angelina soils are associated mainly with Bibb, Johnston, Kershaw, and Cape Fear soils. They contain more clay in the underlying layers than Bibb soils, which are less than 18 percent clay between depths of 10 and 40 inches. They have a grayer surface layer than Johnston soils and a thicker, grayer surface layer than Cape Fear soils. Angelina soils are wetter than Kershaw soils, which are excessively drained.

Angelina and Bibb soils, frequently flooded (AB).—This mapping unit occurs on the flood plains of major streams. It is about 40 percent Angelina soils, 20 percent Bibb soils, and 40 percent other soils. The percentages within the mapped areas vary, but most mapped areas contain both major soils.

Angelina soils are very poorly drained, and Bibb soils are poorly drained. These soils formed in recent deposits of sediments washed from soils on the Coastal Plain.

The Angelina soils have a surface layer of very dark gray loam about 3 inches thick. The underlying layers are black to light-gray sand to silty clay loam.

The Bibb soils have a surface layer of light brownish-gray loamy sand about 18 inches thick. The underlying layers are mottled light-gray to greenish-gray coarse sand to sandy loam. The clay content between depths of 10 and 40 inches is less than 18 percent.

Included with these soils in mapping are small areas of Chipley, Kershaw, and Ocilla soils.

This mapping unit is of moderate extent in Bryan and Chatham Counties. The higher water table and frequent floods make the soils unsuitable for cultivation. All the acreage is in water-tolerant hardwoods. Logging operations are generally carried out late in summer and in fall when floods are least likely to occur. Most of the acreage is managed for hunting and fishing. Capability unit VIIw–1; woodland group 2w9.

Bibb Series

The Bibb series consists of poorly drained soils on the flood plains of major streams. These soils are very frequently flooded. They formed in recent sediments from the Coastal Plain. The material is stratified and loamy and sandy. In most areas slopes are less than 2 percent, but some areas have uneven relief caused by cutting and shifting of channels during floods. In Bryan and Chatham Counties, Bibb soils are mapped only with Angelina soils.

In a representative profile, the surface layer is light brownish-gray loamy sand about 18 inches thick. It is underlain by layers of sandy loam and sand that are mainly shades of gray and have mottles that range from olive gray to light yellowish brown.

These soils are very strongly acid throughout, contain small to medium amounts of organic matter, and are low in natural fertility. Permeability is moderate, and the available water capacity is low to medium.

Most of the acreage occurs along the major rivers and is entirely in forest. The principal trees are cypress, blackgum, sweetgum, red maple, water oak, and water tupelo.

Representative profile of a Bibb loamy sand, about three-fourths of a mile northwest of old Ogeechee-Savannah Canal and a half mile west of State Route 204 along an old logging road, Chatham County:

A1—0 to 18 inches, light brownish-gray (2.5Y 6/2) loamy sand; weak, fine, granular structure; very friable; many small and large roots; very strongly acid; clear, wavy boundary.

C1—18 to 24 inches, light brownish-gray (2.5Y 6/2) sandy loam; many, coarse, distinct, olive-gray (5Y 4/2) mottles; weak, fine, granular structure; very friable; many small and large roots; pockets of sand; very strongly acid; gradual, wavy boundary.

C2—24 to 30 inches, light olive-gray (5Y 6/2) coarse sand; single grain; loose; very strongly acid; clear, wavy boundary.

C3—30 to 46 inches, mottled light olive-gray (5Y 6/2) and gray (5Y 5/1) sand, sandy loam, and fine sand; single grain to weak, fine, granular structure; very friable to loose; very strongly acid.

The A horizon ranges from 3 to 18 inches in thickness. It is very dark gray to light brownish-gray sandy loam to loamy sand. The C horizon varies in thickness. It is stratified loam to coarse sand. The average clay content between depths of 10 and 40 inches is less than 18 percent. The C horizon ranges from light gray to greenish gray in color and has bright-colored mottles in places.

Bibb soils are associated with Angelina, Johnston, Kershaw, and Cape Fear soils. Bibb soils contain less clay than Angelina soils. They have a grayer A horizon than Johnston and Cape Fear soils. They are poorly drained, whereas Kershaw soils are excessively drained.

Cape Fear Series

The Cape Fear series consists of very poorly drained soils that have a clayey subsoil. These soils occupy depressions and drainageways and are frequently flooded. Slopes are 0 to about 2 percent.

In a representative profile, the surface layer is very dark gray clay loam about 10 inches thick. The subsoil, to a depth of 72 inches, is dark-gray plastic clay or sandy clay that is mottled with yellowish brown, light olive brown, strong brown, and gray.

Cape Fear soils are moderately low in natural fertility and have medium organic-matter content in the surface layer. They are very strongly acid throughout. Permeability is slow, and the available water capacity is medium. These soils are subject to very frequent flooding, and the water table is at or near the surface for long periods.

Cape Fear soils are extensive in the central part of the survey area. Almost all of the acreage is wooded with water-tolerant hardwoods, mostly blackgum, sweetgum, cypress, water oak, bay, and willow oak. A very small acreage is used for pasture. Cape Fear soils are difficult to manage because of the plastic subsoil and excess water.

Representative profile of a Cape Fear soil that has a clay loam surface layer, 0.9 mile north of U.S. Highway No. 80 on Travis Field Road, 75 yards north of Pipe Makers Canal, and 100 feet west of Travis Field Road, Chatham County:

A1—0 to 10 inches, very dark gray (10YR 3/1) clay loam; moderate, medium, granular structure and weak, fine, subangular blocky structure; firm; common small roots; very strongly acid; gradual, wavy boundary.

B2tg—10 to 38 inches, dark-gray (10YR 4/1) clay; few, fine, distinct, yellowish-brown (10YR 5/8) mottles; strong, medium and coarse, angular blocky structure; extremely firm; very strongly acid; gradual, wavy boundary.

B3tg—38 to 72 inches, dark-gray (10YR 4/1) sandy clay; common, medium, distinct mottles that are light olive brown (2.5Y 5/6), gray (5Y 6/1), and strong brown (7.5YR 5/8); weak, fine, subangular blocky structure; firm; few fine mica flakes; very strongly acid.

The A1 horizon ranges from very dark gray to black in color and is clay loam, loam, and sandy loam in texture. Minimum thickness of the A1 horizon is 10 inches, and in most places the horizon is not more than 20 inches thick. The B horizon is very dark gray to dark gray and clay to sandy clay. Mottles of shades of brown occur in the B horizons and are most distinct in the B3tg horizon. In places lenses and pockets of sand occur in the lower part of the B3tg horizon below a depth of about 50 inches. The weighted average clay content of the upper 20 inches of the B2tg horizon is about 45 percent but ranges from 35 to 55 percent.

The Cape Fear soils mapped in these counties differ from typical Cape Fear soils because they have less silt and more sand in the B horizon. They are enough like the typical Cape Fear soils in morphology, composition, and behavior that a new series is not warranted.

The Cape Fear soils occur mainly with Pooler, Ogeechee, Meggett, and Wahee soils. They are more poorly drained than Pooler, Wahee, and Ogeechee soils and have a thicker, very dark gray surface layer. Cape Fear soils are very strongly acid, whereas Meggett soils are slightly acid to moderately alkaline. They are wetter and are not so yellow in the upper part of the subsoil as Wahee soils.

Cape Fear soils (Cc).—These very poorly drained soils occur in depressions and drainageways in areas that do not have a well-defined natural drainage channel. Cape Fear soils are flooded by streams during heavy rains. The surface layer ranges from clay loam to loam or sandy loam within the mapped areas. Slopes range from 0 to about 2 percent.

Included with these soils in mapping are small areas mainly of Pooler and Ogeechee soils.

Wetness limits the suitability of these soils for plants. The water table is at or near the surface for long periods.

These soils are not suited to cultivated crops. Pasture plants grow fairly well if managed intensively. Management should include drainage and additions of fertilizer and lime. If adequately drained, these soils are suited to bahiagrass, dallisgrass, and white clover.

Most of the acreage is wooded. Capability unit Vw–1; woodland group 2w9.

Capers Series

The Capers series consists of very poorly drained soils of the tidal marsh flats in the eastern part of Bryan and Chatham Counties. These soils are flooded when tides are higher than normal. The vegetation is mostly salt-tolerant grasses.

In a representative profile, the surface layer is very dark gray and black clay loam about 19 inches thick. The underlying material, to a depth of 60 inches, is clay or silty clay. It is dark gray in the upper part and greenish gray in the lower part.

The surface layer is high in organic-matter content and natural fertility. Salt content is generally high. The available water capacity is high, and permeability is slow. Reaction of the Capers soils is generally neutral when the soils are flooded, but when diked and allowed to dry, the soils rapidly become extremely acid as the sulfur is oxidized to sulfates.

Areas of Capers soils in the western part of the marsh belt were diked and used intensively for rice production in the 19th century. Some of these areas are now grazed by cattle. The native vegetation is mixed smooth cordgrass, black rush, marsh hay cordgrass, seashore saltgrass, and giant cutgrass. Some cattails grow next to fresh water streams. The high sulfur content, high water table, and poor tilth limit the use of Caper soils.

Representative profile of a Capers clay loam in an area of Capers soils, about three-fourths of a mile south of Burroughs on Chevis Road, southeast onto private road 1 mile, southeast on field road to dike, about 150 yards east of dike, and 20 yards south of upland, Chatham County:

A11—0 to 8 inches, very dark gray (10YR 3/1) clay loam; massive; very sticky; many, large, pithy, fibrous roots; common small clam shells on surface; extremely acid; gradual, wavy boundary.

A12—8 to 19 inches, very dark gray (10YR 3/1) and black (10YR 2/1) clay loam; massive; very sticky; many, large, fibrous roots; very strongly acid; clear, wavy boundary.

C1g—19 to 33 inches, dark-gray (10YR 4/1) clay; massive; very sticky; many small roots; medium acid; gradual, wavy boundary.

C2g 33 to 50 inches, greenish-gray (5GY 5/1) clay; weak to moderate, fine, subangular blocky structure; very sticky; few small roots; mildly alkaline; gradual, wavy boundary.

C3g—50 to 60 inches, greenish-gray (5GY 5/1) silty clay; weak, fine, subangular blocky structure; very sticky; few small roots; mildly alkaline.

The black to very dark gray A11 horizon ranges from loam to silty clay loam or clay loam and is underlain by a gray loamy sand A2 horizon in some places. Depth to the C horizon ranges from 14 to 26 inches. The C2g horizon is gray to greenish gray in color and ranges from clay loam to clay in texture. The sulfur content in the A horizon is 1 or 2 percent and is generally less than 1 percent in the C horizon. The reaction is neutral to mildly alkaline, but when air dried, the sulfur changes to sulfates, and this causes the pH to drop very rapidly in the upper part of the profile to a pH of 3 or less. The organic-matter content of the surface layer ranges from 10 to about 15 percent but is about 12 or 13 percent in most places.

Capers soils are associated with the Ellabelle and Chipley soils and with Tidal marsh, salty. They contain more clay in the underlying layers than Ellabelle and Chipley soils and are flooded by high tides. Capers soils typically are flooded less frequently by normal high tides than Tidal marsh, salty, and have a more uniform soil profile.

Capers soils (Cn).—The surface layer of Capers soils ranges from loam to silty clay loam and clay loam.

Included with these soils in mapping are small areas of Tidal marsh, salty, at low elevations and wooded areas of Ellabelle soils at high elevations.

Most of the acreage is in native grass, and a few small areas are used for pasture. Tilth is typically poor. In native condition these soils support only salt-tolerant vegetation. The high water table, slow permeability, and the high content of sulfur and salt are very severe limitations in managing these soils for crops and pasture. Where the reaction is pH 4.0 or less, as much as 20 tons of lime per acre may be required to control the acidity.

These soils are suited mainly as habitat for shorebirds and waterfowl. Capability unit VIIw–3; not assigned a woodland group.

Chipley Series

The Chipley series consists of sandy soils on broad ridges of the uplands and the coastal islands. These soils are moderately well drained and occur between very poorly drained soils near bays and drainageways and higher, somewhat excessively drained, sloping soils on bluffs adjacent to the marshland. Locally, the Chipley soils are very gently sloping to nearly level.

In a representative profile, the surface layer is very dark grayish-brown fine sand about 7 inches thick. Under this, to a depth of about 65 inches, is a layer of fine sand. This layer is olive brown, mottled light olive brown, mottled light yellowish brown, and mottled light gray.

Chipley soils are low in natural fertility and organic-matter content. Permeability is rapid, and the available water capacity is very low and low. These soils are very strongly acid and strongly acid throughout. Aeration of roots below a depth of 20 inches is restricted at times by a high water table.

Chipley soils are extensive in the survey area. Except around Savannah, most of the acreage is wooded. Areas around Savannah have been developed for residential or industrial use. The native vegetation is chiefly loblolly pine and slash pine. The understory is waxmyrtle or gallberries on the mainland and yaupon on the islands.

Representative profile of Chipley fine sand, 1.8 miles east-northeast of Keller and 0.2 mile north on George Washington Carver School Road, 25 feet west of road, Bryan County:

A1—0 to 7 inches, very dark grayish-brown (2.5Y 3/2) fine sand; weak, medium, granular structure; very friable; many small and medium roots; very strongly acid; clear, wavy boundary.

C1 7 to 18 inches, olive-brown (2.5Y 4/4) fine sand; single grain to weak, fine, granular structure; very friable; many small and medium roots; very strongly acid; gradual, smooth boundary.

C2 18 to 33 inches, light olive-brown (2.5Y 5/4) fine sand; common, fine, distinct, light-gray (2.5Y 7/2) mottles; single grain; very friable; few small roots; very strongly acid; gradual, wavy boundary.

C3—33 to 43 inches, light yellowish-brown (2.5Y 6/4) fine sand; common, medium, distinct, brownish-yellow (10YR 6/6) mottles and common, fine, distinct, light-gray (2.5Y 7/2) mottles; single grain; very friable; few small roots; very strongly acid; gradual, wavy boundary.

C4—43 to 57 inches, light yellowish-brown (2.5Y 6/4) fine sand; common, fine, distinct, light-gray (2.5Y 7/2) mottles and common, coarse, prominent, yellowish-red (5YR 5/8) mottles; single grain; very friable; few small roots; very strongly acid; gradual, wavy boundary.

C5—57 to 65 inches, light-gray (2.5Y 7/2) fine sand; few, fine, prominent, strong-brown (7.5YR 5/8) mottles; single grain; very friable; very strongly acid.

The A1 or Ap horizon ranges from gray, very dark gray, and dark grayish brown to very dark grayish brown. The C1 horizon is pale yellow and olive brown to yellowish brown. Light-gray mottles typically are at a depth of about 24 to 30 inches, but they are as shallow as 15 inches or as deep as 33 inches in some places. Content of silt and clay in the uppermost 40 inches of soil is 5 to 10 percent. The profile typically is fine sand, but in some areas sand or coarse sand occurs.

Chipley soils are associated chiefly with the Lakeland, Leon, Olustee, and Ellabelle soils. They are not so well drained as the Lakeland soils, which are free of gray mottles within 40 inches of the surface. They do not have the stained or dark-brown humus layer within 20 inches of the surface that is typical of Leon and Olustee soils. They are better drained and less gray than the very poorly drained Ellabelle soils.

Chipley fine sand (Cm).—This soil occurs on broad sandy ridges and is moderately well drained. It has the profile described as representative for the series. Slopes range from 0 to about 2 percent.

Included with this soil in mapping are small areas of Leon, Lakeland, and Ellabelle soils.

This soil has good tilth and is suited to corn, soybeans, tobacco, and truck crops. It is also suited to pasture plants, such as Coastal bermudagrass and bahiagrass, and to pine trees. Crops respond well to good management, especially the addition of fertilizer. The water table, however, is alternately high and low, and both drainage and irrigation may be needed in a single growing season if tobacco or a similar crop is grown. Suited crops can be grown continuously if crop residues are returned to the soil. Most of the acreage is wooded. Capability unit IIIs–1; woodland group 2w2.

Chipley-Urban land complex (Cuc).—This complex is 40 to 70 percent Chipley soils and 20 to 40 percent Urban land; the rest is Lakeland, Kershaw, and Osier soils.

The surface layer of Chipley soils is very dark grayish brown to gray. The underlying layer is olive brown to light yellowish brown mottled with gray within 40 inches of the surface. The texture is fine sand to a depth of 6 feet or more. A seasonal high water table is 15 to 36 inches below the surface. In places the soil profile has been altered.

Urban land is covered by urban facilities, such as houses, industrial buildings, paved parking areas, airport runways, paved streets, driveways, sidewalks, patios, swimming pools, and other structures. In some places the landscape has been altered by cutting, filling, grading, and shaping. Because the soils in parts of Urban land are obscured by works and structures, their identification is impractical.

The Lakeland and Kershaw soils are excessively drained, and the Osier soils are poorly drained. The Kershaw soils in this unit occur only on Tybee Island.

The percentages of the component parts of the complex vary slightly from area to area. Mapped areas of this unit are confined to the populated and industrial areas around Savannah and the adjoining towns and communities. Capability unit IIIs–1; not assigned to a woodland group.

Coastal Beach

Coastal beach (Cub) is mainly on the ocean side of Tybee, Little Tybee, Wassaw, and Ossabaw barrier islands. It is covered twice daily by the tides and is constantly washed by the sea (fig. 5). It adjoins areas of Kershaw and Osier soils and Tidal marsh, salty.

Figure 5.—Barren Coastal beach and vegetated Kershaw-Osier complex.

The mildly alkaline, gray fine sand is highly saline and contains varying amounts of small shell fragments. It slopes gently toward the sea. The prevailing currents move parallel to the beach in a southward direction. This current and the action of breakers erode the northern end of the islands and build up the southern end. This action also constantly changes the shape and extent of the beaches. Capability unit VIIIs-1; not assigned to a woodland group.

Craven Series

The Craven series consists of moderately well drained soils that occur on low knolls, short, choppy slopes, and the crest of low ridges. These soils are nearly level to very gently sloping. Slopes are mainly 1 to 5 percent.

In a representative profile, the surface layer is dark grayish-brown loamy fine sand about 7 inches thick. The subsurface layer is yellowish-brown fine sandy loam about 5 inches thick. The subsoil, to a depth of 40 inches, is

sandy clay that is mainly yellowish red in the upper part and mottled red, gray, and shades of brown and red in the lower part. Below a depth of 40 inches, the subsoil is red and yellowish-red sandy clay loam mottled with shades of gray and red and extending to a depth of 65 inches. The underlying material, to a depth of 75 inches, is mottled yellowish-red, gray, red, strong-brown, and pale-brown sandy clay loam and sandy loam.

Craven soils are low in natural fertility and organic-matter content. Permeability is slow, and the available water capacity is medium. These soils are strongly acid to very strongly acid throughout.

Craven soils are not extensive in Bryan and Chatham Counties, but about 30 percent of the acreage is cultivated or pastured. The present vegetation is chiefly loblolly pine, slash pine, red oak, sweetgum, and hickory.

Representative profile of Craven loamy fine sand, one-fourth mile west of Richmond Hill city limits and the Fort Stewart Military Reservation boundary on State Route 67, south roadbank, Bryan County:

A1—0 to 7 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

A2—7 to 12 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, medium, granular structure; very friable; common, fine, yellowish-red peds from the B21t horizon and dark grayish-brown peds from the A1 horizon; many fine roots; strongly acid; clear, irregular boundary.

B21t—12 to 21 inches, yellowish-red (5YR 4/6) sandy clay; few, fine and medium, red (10R 4/6) and light yellow-brown (10R 6/4) mottles; moderate, fine, subangular and angular blocky structure; firm; few clay films on some ped surfaces; common medium roots; very strongly acid; gradual, wavy boundary.

B22t—21 to 40 inches, mottled red (2.5YR 4/6), gray (10YR 6/1), yellowish-brown (10YR 5/4), and grayish-brown (10YR 5/2) sandy clay; moderate, fine, subangular blocky structure; firm; clay films on some ped surfaces; common medium roots; very strongly acid; gradual, wavy boundary.

B23t—40 to 48 inches, mottled red (2.5YR 4/6), gray (10YR 6/1), pale-brown (10YR 6/3), and yellowish-red (5YR 4/6) sandy clay loam; weak, fine, subangular blocky structure; firm; few clay films on ped surfaces; very strongly acid; gradual, wavy boundary.

B3t—48 to 65 inches, yellowish-red (5YR 4/6) sandy clay loam; common, medium, prominent, gray (10YR 6/1) mottles and few, medium, prominent, red (2.5YR 4/6) mottles; weak, very fine, subangular blocky structure; friable; very strongly acid; gradual, wavy boundary.

C—65 to 75 inches, mottled yellowish-red (5YR 5/8), gray (10YR 6/1), red (2.5YR 4/6), strong-brown (7.5YR 5/8), and pale-brown (10YR 6/3) stratified sandy clay loam and sandy loam; massive; friable; very strongly acid.

The A1 horizon ranges from dark gray to dark grayish brown, and the A2 horizon ranges from olive brown to yellowish brown. The B21t horizon is yellowish-brown to yellowish-red sandy clay. The B22t and B23t horizons are highly mottled red, gray, and yellowish brown. Texture is typically sandy clay loam or sandy clay. The weighted average clay content of the upper 20 inches of the Bt horizon is typically about 42 percent but ranges from 35 percent to 55 percent. The clay content decreases from the maximum by more than 20 percent within 60 inches of the surface.

Craven soils are associated mainly with Ocilla, Wahee, Pooler, Ogeechee, and Pelham soils. They are better drained and have a thinner A horizon than the Ocilla and Pelham soils. They are better drained than Pooler and Ogeechee soils, which are grayer and have dominant light-gray colors immediately under the A horizon. They are better drained than Wahee soils and lack light-gray mottles in the upper 5 inches of the subsoil.

Craven loamy fine sand (Cx).—This soil is mainly level to nearly level, but slopes range from about 1 to 5 percent.

Included with this soil in mapping are areas of Ocilla, Wahee, and Pelham soils. Also included are small areas of a soil similar to this Craven soil except that it has a thicker solum.

This soil is mostly wooded, though a small acreage is cultivated and pastured. This soil is suited to most locally grown crops, including corn, soybeans, rye, and oats and to Coastal bermudagrass, bahiagrass, crimson clover, and similar pasture or hay plants.

Some drainage practices are needed where cultivated crops are grown. These practices are digging open ditches, land leveling and shaping, or bedding. Most of the acreage is not suited to tile drainage, because water moves slowly through the fine-textured subsoil. Crops on this soil respond well to fertilizer and lime. Plant residue should be managed so as to leave it on the surface between the time of harvesting and planting. Erosion is not a hazard.

Corn or other suited crops can be grown continuously if management is good. Capability unit IIw–3; woodland group 3w2.

Dothan Series

The Dothan series consists of well-drained, nearly level soils that occur on very gently undulating ridges only in Bryan County. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is grayish-brown loamy sand about 8 inches thick. The subsurface layer is brownish-yellow loamy sand or sandy loam about 8 inches thick. The subsoil, to a depth of 60 inches, is sandy clay loam that contains plinthite below a depth of about 32 inches. The upper and middle parts of the subsoil are yellowish brown, and the lower part is mottled red, strong brown, yellowish brown, and light gray.

These soils are low in natural fertility and organic-matter content. Permeability is moderately slow, and the available water capacity is medium. Reaction is very strongly acid or strongly acid throughout except where the soil has been limed.

Dothan soils are not extensive in the survey area. All of the acreage has been cultivated, but presently about 60 percent is cultivated and the rest is in pasture. Dothan soils are suited to many kinds of locally adapted crops. Crops on this soil respond well to good management.

Representative profile of Dothan loamy sand, 1.5 miles west of Pembroke High School on paved county road and 10 feet south of road at edge of field, Bryan County:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) loamy sand; weak, fine, granular structure; very friable; many small roots; medium acid; clear, wavy boundary.

A2—8 to 16 inches, brownish-yellow (10YR 6/6) loamy sand or sandy loam; weak, fine, granular structure; very friable; few small roots; strongly acid; gradual, wavy boundary.

B1t—16 to 22 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, fine, subangular blocky structure;

friable; few small roots; very strongly acid; gradual, wavy boundary.

B21t—22 to 32 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, fine, subangular blocky structure; firm; few, small, hard, brown iron concretions; very strongly acid; gradual, wavy boundary.

B22t—32 to 42 inches, yellowish-brown (10YR 5/8) sandy clay loam; few, fine, faint, pale-brown (10YR 6/3) mottles; weak, fine, subangular blocky structure; firm; yellowish-red and strong-brown plinthite nodules make up about 3 percent of layer; very strongly acid; gradual, wavy boundary.

B3t—42 to 60 inches, mottled red (2.5YR 4/8), strong-brown (7.5YR 5/8), yellowish-brown (10YR 5/8), and light-gray (2.5Y 7/2) sandy clay loam; weak, very fine, subangular blocky structure; firm; plinthite makes up about 8 percent of layer; very strongly acid.

The combined thickness of the A horizons is generally about 16 inches but ranges from 9 to 17 inches. The Ap or A1 horizon ranges from dark grayish brown to very dark grayish brown. The A2 horizon is brownish yellow, light olive brown, and light brownish yellow. Depth to gray mottles commonly is about 42 inches but ranges from about 40 to 72 inches or more. The B1t and B21t horizons are yellowish brown to strong brown. In most areas, the weighted average clay content of the upper 20 inches of the Bt horizon is about 25 percent, though the range is from 35 to 18 percent. A few, small, hard, brown iron concretions occur on the surface and in the profile in some areas. Plinthite makes up more than 5 percent of the B horizon between depths of 27 and 60 inches.

Dothan soils commonly occur with Fuquay, Stilson, and Pelham soils. They have a sandy A horizon less than 20 inches thick, and the Fuquay soils do not. Dothan soils are better drained and are not so gray as the Pelham and Stilson soils.

Dothan loamy sand (Do).—This well-drained soil occurs on ridges where the local relief ranges from 3 to 15 feet above the surrounding area.

Included with this soil in mapping are small areas of Fuquay, Stilson, and Pelham soils.

About three-fourths of the acreage is cultivated and pastured; the rest is wooded. This soil has good tilth and is well suited to all crops grown locally, including corn, cotton, peanuts, soybeans, and small grain, and to Coastal bermudagrass, bahiagrass, crimson clover, and similar pasture or hay plants. Crops on this soil respond well to fertilizer and lime, and sprinkler irrigation can be used effectively to offset droughts.

An example of a suitable cropping system that helps to control erosion and to maintain organic-matter content is 1 year of tobacco followed by 2 years of Coastal bermudagrass. Corn can be grown continuously where this soil is level, provided the plant residue is managed so as to leave it on the surface between the time of harvesting and planting.

This soil is also suited to pine trees. Capability unit IIs–1; woodland group 2o1.

Ellabelle Series

The Ellabelle series consists of very poorly drained soils in depressions and drainageways. The depressions are ponded, and the drainageways lack well-defined natural channels. These soils formed in mainly medium-textured materials of the Coastal Plain. Slopes range from 0 to about 2 percent.

In a representative profile, the surface layer is black loamy sand about 11 inches thick. The subsurface layer is light brownish-gray loamy sand also about 11 inches thick. The subsoil, to a depth of about 60 inches, is gray sandy clay loam mottled with yellowish brown and strong brown in the upper part and with yellowish brown in the lower part.

These soils have a seasonal high water table near the surface and are flooded for extended periods. The organic-matter content normally is medium to high in the surface layer but is low below a depth of about 10 to 20 inches. Natural fertility is low. Ellabelle soils are very strongly acid. Permeability is moderate. The available water capacity is mainly low in the uppermost 40 inches of soil.

Ellabelle soils occur throughout Bryan and Chatham Counties. All of the acreage is wooded. The native vegetation in most areas is mixed loblolly pine or slash pine and blackgum, cypress, and sweetgum. In some areas the vegetation is a pure stand of hardwoods, chiefly blackgum, cypress, and sweetgum.

Representative profile of Ellabelle loamy sand, 3.9 miles northeast of Pembroke on State Route 119, one-fourth mile north on dirt road, in cypress pond 100 feet east of road, Bryan County:

A1—0 to 11 inches, black (10YR 2/1) loamy sand; weak, fine, granular structure; very friable; many fine roots; small splotches of light brownish-gray material; very strongly acid; clear, wavy boundary.

A2—11 to 22 inches, light brownish-gray (2.5Y 6/2) loamy sand; weak, fine, granular structure; very friable; many fine roots; few, small pockets of dark-gray material; very strongly acid; clear, wavy boundary.

B2tg—22 to 48 inches, gray (10YR 5/1) sandy clay loam; common, fine, prominent, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure; firm; pockets of sandy clay; very strongly acid; gradual, wavy boundary.

B3g—48 to 60 inches, gray (10YR 5/1) sandy clay loam; common, fine, prominent, yellowish-brown (10YR 5/6) mottles; firm; weak, very fine, subangular blocky structure; very strongly acid.

The A1 horizon is very dark gray to black loam. It typically is 10 to 20 inches thick but is thicker in some places. The light-gray to gray A2 horizon is present in most places. The total thickness of the A horizon generally is about 22 inches but ranges from 14 to 36 inches. The weighted average clay content of the upper 20 inches of the Bt horizon is about 25 percent in most areas but ranges from 18 to 35 percent. The B2tg horizon ranges from heavy sandy loam to clay loam. Fine mottles of yellowish brown to strong brown occur in the B horizons.

Ellabelle soils are associated chiefly with the Cape Fear, Chipley, Kershaw, Ogeechee, and Leon soils. They are less clayey than Cape Fear soils. They are more poorly drained than Ogeechee soils and have a black surface layer more than 10 inches thick. They are not so brown as and are more poorly drained than Chipley and Kershaw soils. They contain more clay in the subsoil than Leon soils, which have a dark reddish-brown Bh layer.

Ellabelle loamy sand (El).—This is the only Ellabelle soil mapped in Bryan and Chatham Counties.

Included with this soil in mapping are small areas of Ocilla, Pelham, and Ogeechee soils.

The seasonal high water table is at or near the surface for extended periods.

All of the acreage is wooded. The hazard of flooding and the seasonal high water table limit the suitability of

this soil for crops and trees. This soil is not suited to cultivated crops, but pasture plants grow fairly well if the soil is managed intensively. The management should include drainage and addition of fertilizer and lime in amounts needed. Where drained adequately, these soils are suited to bahiagrass, dallisgrass, and white clover. Where the excess surface water is removed, slash pine and loblolly pine grow better than in undrained areas. Capability unit Vw–1; woodland group 2w9.

Fresh Water Swamp

Fresh water swamp (Fws) is a wet, forested miscellaneous land type that occurs on the lower flood plain of the Canoochee River and on the flood plain of the Ogeechee River.

This land type consists chiefly of mixed silty sediments and organic matter. Some areas have a soft surface and are difficult to cross. Daily high tides reverse the flow of streams and force about 4 to 12 inches of fresh water over a large part of the acreage. In places old meanders are evident, and the relief is uneven. Profiles in this land type are stratified, and their layers vary in color, texture, and thickness.

All of the acreage is forested. The principal trees are cypress, blackgum, sweetgum, red maple, water oak, and water tupelo. Before the twentieth century, part of the acreage was diked and used for growing rice, but this acreage is now forested. Capability unit VIIw–1; not assigned to a woodland group.

Fuquay Series

The Fuquay series consists of well-drained, nearly level to very gently sloping soils. These soils occur in undulating upland areas. Local relief ranges from about 1 to 20 feet above the surrounding area.

In a representative profile, the surface layer is dark grayish-brown loamy sand about 7 inches thick. The subsurface layer is yellowish-brown loamy sand about 17 inches thick. The subsoil extends to a depth of about 80 inches and is mainly sandy clay loam. It is yellowish brown in the upper part, yellowish brown mottled with strong brown, light gray, and red in the middle, and mottled light gray, red, and yellowish brown in the lower part. Plinthite makes up more than 5 percent of some layers between depths of 34 and 60 inches.

These soils are low in organic-matter content and natural fertility. They are very strongly acid. Permeability is rapid in the upper part of the soil and slow in the lower part. The available water capacity is low.

The native vegetation is chiefly slash pine and longleaf pine, and the understory is wiregrass. Approximately 75 percent of the acreage of Fuquay soils is cultivated and pastured. These soils are suited to a wide range of crops, but the available water capacity is low and the soils are droughty during extended dry periods.

Representative profile of Fuquay loamy sand, about 4.6 miles north of Pembroke on State Route 119, northwest on paved county road for 0.6 mile, north on trail at sharp curve of paved road to borrow pit, south bank of borrow pit, 100 feet east of southwest corner, Bryan County:

A1 -0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; clear, smooth boundary.

A2—7 to 24 inches, yellowish-brown (10YR 5/6) loamy sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; gradual, wavy boundary.

B1—24 to 30 inches, yellowish-brown (10YR 5/8) sandy loam; weak, very fine, subangular blocky structure; friable; few small roots; very strongly acid; gradual, wavy boundary.

B21t—30 to 50 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, fine, subangular blocky structure; firm; few small roots; 3 to 4 percent red plinthite nodules in lower part; very strongly acid; gradual, wavy boundary.

B22t -50 to 70 inches, mottled yellowish-brown (10YR 5/8), strong-brown (7.5YR 5/6), light-gray (10YR 7/1), and red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; firm; soft plinthite makes up about 8 percent of layer; few, hard, red iron concretions; very strongly acid; gradual, wavy boundary.

B3t—70 to 80 inches, mottled light-gray (10YR 7/1), red (2.5YR 4/6), and yellowish-brown (10YR 5/8) sandy clay loam that has pockets of sandy clay; weak, coarse, subangular blocky structure; firm; very strongly acid.

The combined thickness of the A horizons ranges from 21 to 36 inches. The B1 and B21t horizons range from brownish yellow to strong brown. The B22t horizon is mottled red, brownish yellow, strong brown, yellowish brown, and light gray. The weighted average clay content of the upper 20 inches of the Bt horizon is typically about 25 to 30 percent, but the range is from 20 to 35 percent. The horizons that are more than 5 percent plinthite occur chiefly between depths of 40 and 60 inches.

Fuquay soils are associated with Dothan, Stilson, Albany, Lakeland, and Pelham soils. They are better drained than Albany and Stilson soils and lack gray mottles in the upper part of the B horizon. They are not so gray as the poorly drained Pelham soils. They are less sandy than Lakeland soils. They have a sandy A horizon that is thicker than that of Dothan soils.

Fuquay loamy sand (Fs).—This is the only Fuquay soil mapped in Bryan and Chatham Counties. Slopes range from 0 to 5 percent.

Included with this soil in mapping are small areas of Stilson, Pelham, and Lakeland soils.

This soil has good tilth and responds well to good management, especially to additions of fertilizer.

Most of the acreage is cultivated or pastured, though a small percentage is wooded.

This soil is well suited to all crops grown locally, including corn, cotton, peanuts, soybeans, and small grain, and to Coastal bermudagrass, bahiagrass, crimson clover, and similar pasture or hay plants (fig. 6). Crop response is reduced in dry seasons because this soil dries out quickly, but sprinkler irrigation can be used effectively to offset droughts. Crops on this soil respond well to fertilizer and lime.

An example of a suitable cropping system that helps to control erosion and to maintain organic-matter content is 1 year of peanuts followed by 2 years of Coastal bermudagrass. Corn can be grown continuously where this soil is level, providing the plant residue is managed so as to leave it on the surface between the time of harvesting and planting.

This soil is also suited to pine trees. Capability unit IIs–1; woodland group 3s2.

Figure 6.—Coastal bermudagrass hay harvested on Fuquay loamy sand.

Johnston Series

The Johnston series consists of very poorly drained soils along streams that overflow very frequently. These soils formed in loamy alluvium from the Coastal Plain, and they have a large amount of organic matter in the upper part.

In a representative profile, the surface layer is black and about 40 inches thick. It is loam in the upper 5 inches and sandy loam below. The sandy loam layer has a few gray mottles. Below a depth of 40 inches is gray fine sandy loam that extends to a depth of 60 inches.

Johnston soils are low in natural fertility, but the surface layer has enough organic matter to make it feel loamy. The available water capacity is medium, and permeability is moderately rapid. These soils are very strongly acid. They are frequently flooded, and the water table is at or near the surface for extended periods.

Johnston soils are not extensive in the survey area. The present vegetation is water-tolerant hardwoods, chiefly blackgum, cypress, red maple, and bay.

Representative profile of Johnston loam in a wooded area, about 3.2 miles northwest of Black Creek School, 50 feet south of paved county road, and 50 feet east of Georges Branch dug canal, Bryan County:

A11—0 to 4 inches, black (N 2/0) loam; weak, fine, granular structure; friable; very strongly acid; gradual, wavy boundary.

A12—4 to 40 inches, black (N 2/0) sandy loam; few, fine, distinct, gray (5Y 6/1) mottles; single grain and weak, fine, granular structure; loose and very friable; pockets of sand; organic matter gives loamy feel; very strongly acid; gradual, wavy boundary.

IICg—40 to 60 inches, gray (5Y 5/1) fine sandy loam; massive; firm; very strongly acid.

The A11 horizon is about 4 to 8 inches thick. The A12 horizon is black loam to sand that is mottled with light gray to dark gray. This layer grades into a massive IICg horizon

at a depth of about 40 inches in most areas, but depth ranges from 36 inches to 50 inches. The IICg horizon is light gray to gray, though some profiles have grayish-brown or olive-brown mottles and texture that ranges from fine sandy loam to stratified sand and sandy loam.

Johnston soils are associated with Stilson, Pelham, Ellabelle, and Mascotte soils. They are more poorly drained and not so yellow as Stilson soils. They have a thicker black surface layer than Pelham soils and lack the black stained layer that occurs in Mascotte soils. They have less clay in the underlying layers than Ellabelle soils.

Johnston loam (Je).—This very poorly drained soil occurs on flood plains along medium-sized streams and branches. The mapped areas are long and typically less than one-fourth mile wide.

Included with this soil in mapping are small areas of Stilson, Ellabelle, and Pelham soils.

All of the acreage is wooded, chiefly with water-tolerant hardwoods. Because of the high water table and frequent flooding, this soil is not suited to cultivation (fig. 7). If it is protected from flooding and adequately drained, this soil is suited to pasture. Suitable plants are oats, rye, bahiagrass, and white clover. A good use is woodland. Capability unit Vw–2; woodland group 1w9.

Kershaw Series

The Kershaw series consists of excessively drained sandy soils that occur on sand ridges. These ridges are northeast of and adjacent to the major fresh water streams that flow through Bryan and Chatham Counties. Some of these ridges have dunelike topography suggesting that the sand was deposited by wind. Slopes in most areas are 3 to 5 percent, but the range is from 0 to 8 percent.

In a representative profile, the surface layer is very dark grayish-brown coarse sand about 3 inches thick. It is underlain by loose coarse sand that extends to a depth of more than 10 feet. From a depth of 3 to 180 inches, this coarse sand is light yellowish brown, brownish yellow, pale yellow, and strong brown.

Figure 7.—**An area of Johnston loam flooded by stream overflow. Capability unit Vw–2.**

These soils have very rapid permeability. The available water capacity is very low. Natural fertility and organic-matter content also are very low. The reaction is very strongly acid throughout.

Kershaw soils are not very extensive in Bryan and Chatham Counties. The native vegetation in most places is a sparse stand of blackjack and turkey oaks and a few longleaf pines, saw-palmetto (fig. 8), and scattered grasses. On the barrier islands in the eastern part of Chatham County the vegetation is cabbage palmetto, cedar, live oak, and loblolly pine.

Most of the acreage is wooded. About 30 percent of the wooded acreage has been planted to slash pine.

Representative profile of Kershaw coarse sand, 2 to 8 percent slopes, 1.4 miles southwest of Groveland in the bank of a railroad cut, Bryan County:

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) coarse sand; single grain to weak, fine, granular structure; loose; many small roots; very strongly acid; clear, smooth boundary.

C1 3 to 20 inches, light yellowish-brown (10YR 6/4) coarse sand; single grain; loose; few small roots; few small charcoal fragments; very strongly acid; gradual, wavy boundary.

C2—20 to 42 inches, brownish-yellow (10YR 6/6) coarse sand; single grain; loose; very strongly acid; gradual, wavy boundary.

C3—42 to 78 inches, pale-yellow (2.5Y 8/4) coarse sand; single grain; loose; very strongly acid; gradual, wavy boundary.

C4—78 to 180 inches, strong-brown (7.5YR 5/8) coarse sand, coated; single grain; loose; very strongly acid.

In Kershaw soils the content of silt and clay is about 2 to 5 percent. Sharp-edged quartz particles make up the rest of the soil mass. The A horizon is dark gray to very dark grayish brown. Under the A horizon are C horizons consisting of yellowish-brown, light yellowish-brown, pale-brown, and strong-brown coarse sand that is free of light-gray mottles, at least to a depth of 40 inches. The number of C horizons ranges from three to four.

The Kershaw soil in Kershaw-Osier complex differs from the typical Kershaw soils because it has fine sand in the A horizon and has paler colors in the C horizon. This difference does not alter the use or behavior of the soil.

Figure 8.—Sparse vegetation on Kershaw coarse sand, 2 to 8 percent slopes.

Kershaw soils are associated with Chipley, Ellabelle, Lakeland, and Leon soils. They are coarser textured throughout than Lakeland soils. They do not contain gray mottles within 40 inches of the surface as do the Chipley soils. They are not wet and the surface layer is not black as in the very poorly drained Ellabelle soils. They do not contain the dark Bh horizon stained with organic matter that is typical of the wet Leon soils.

Kershaw coarse sand, 2 to 8 percent slopes (KkC).—This is a droughty soil on sand ridges. It has the profile described as representative for the series.

Included with this soil in mapping are small areas of Chipley and Ellabelle soils. In a few areas the slopes are less than 2 percent, and in others they are 10 percent.

Most of the acreage of this soil is wooded, though a few small areas are pastured. Because this soil is very droughty, use is limited to deep-rooted plants. Native vegetation on the mainland is mostly a sparse cover of turkey oak, longleaf pine, palmetto, and wiregrass. On the islands the vegetation is chiefly loblolly pine, live oak, palmetto, and waxmyrtle.

A good use for this soil is woodland for wildlife habitat and watershed protection. Capability unit VIIs–1; woodland group 5s3.

Kershaw-Osier complex (Kic).—This mapping unit occurs only on the barrier islands. The landscape is a series of sandy ridges and valleys parallel and adjacent to the beaches of the Atlantic Ocean. The long axis of the ridges is parallel to the beaches. The ridgetops range from 3 to 25 feet in elevation. Slopes east of the ridge crest are typically gradual, but the western slopes are steep. The ridges were formed by wind and wave action and are now stabilized by vegetation.

The Kershaw soil makes up about 40 percent of the mapping unit and Osier soil about 30 percent. The remaining 30 percent is unstable dunes, Tidal marsh, Coastal beach, and Capers soils.

The Kershaw soil occupies the ridges and is excessively drained. It has a profile similar to the one described as representative for the series, except that the surface layer is fine sand and the underlying layers are paler.

The Osier soil occurs in the valleys and is poorly drained. The water table is at or near the surface for long periods, and some areas are flooded by salt water during storms. This soil has a profile similar to the one described as representative for the Osier series.

The native vegetation varies according to the distance from the ocean. Next to the beach and in areas that are building up, the vegetation is mainly sea oats, but to the west it is waxmyrtle, cabbage palmetto, live oak, and loblolly pine. The trees closest to the beach are grotesquely shaped because of violent winds and salt spray during periods of turbulent weather. In places dwarfed pine and cedar grow nearest to the beach.

These soils are not suited to crops and improved pasture. A good use is woodland for wildlife, watershed protection, and recreation. Capability unit VIIs–1; not assigned to a woodland group.

Lakeland Series

The Lakeland series consists of excessively drained sandy soils. These soils occur on ridges and are nearly level to very gently sloping. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is very dark grayish-brown sand about 8 inches thick. Yellowish-brown to pale-olive sand occurs below the surface layer and extends to a depth of 72 inches. In places small, yellowish-red iron concretions are at varying depths.

Lakeland soils are very strongly acid to strongly acid and are low in natural fertility and organic-matter content. Permeability is rapid, and the available water capacity is very low.

Lakeland soils are extensive in both Bryan and Chatham Counties. Most of the acreage is wooded. These soils are fairly well suited to deep-rooted plants. A small acreage is in pasture, and the rest is cultivated. The present vegetation in wooded areas is chiefly longleaf and slash pines, red oak, blackjack oak, and turkey oak, but in the eastern part of Bryan and Chatham Counties, the stands are mainly loblolly and slash pines, red oak, hickory, and live oak and an understory of waxmyrtle. Some areas have been planted to slash pine (fig. 9).

Representative profile of Lakeland sand, east of Savannah, on Talahi Island, 50 yards north of junction of U.S. Highway No. 80 and Quarterman Drive, 50 feet east of Quarterman Drive, Chatham County:

A1 0 to 8 inches, very dark grayish-brown (10YR 3/2) sand; weak, fine, granular structure; very friable to loose; many small and large roots; very strongly acid; clear, smooth boundary.

C1 8 to 42 inches, yellowish-brown (10YR 5/6) sand; single grain; loose; many small and medium roots; very strongly acid; gradual, wavy boundary.

C2—42 to 72 inches, pale-olive (5Y 6/3) sand; single grain; loose; few large roots; few, soft, yellowish-red iron concretions; very strongly acid.

The A1 horizon ranges from very dark grayish brown to dark grayish brown. The loose sandy C horizon ranges from pale yellow to yellowish brown. The texture to a depth of at least 72 inches is sand or fine sand. The total silt and clay content is typically between 5 and 10 percent.

Lakeland soils occur mainly with Chipley, Leon, and Ellabelle soils. They lack light-gray mottles within a depth of 40 inches that are common in Chipley soils. They lack the dark reddish-brown, stained subsurface layer that is in Leon soils. They are better drained than the very poorly drained Ellabelle soils.

Lakeland sand (Lp).—This soil is excessively drained. Slopes range from 0 to 5 percent.

Included with this soil in mapping are small areas of Chipley, Leon, and Ellabelle soils. Also included are small areas of a soil that is similar to Lakeland sand except that it is alkaline.

A small acreage is cultivated and pastured. The rest is wooded, except for areas developed for urban uses in the immediate vicinity of Savannah. Droughtiness limits the suitability of this soil for crops. Suitable crops are Coastal bermudagrass, bahiagrass, and other deep-rooted plants, as well as early maturing vegetables and corn, peanuts, and watermelons. An example of a suitable cropping system is bahiagrass grown for 2 years followed by peanuts grown on the contour for 1 year.

This soil is fairly well suited to pine trees. Capability unit IVs–1; woodland group 4s2.

Leon Series

The Leon series consists of poorly drained, nearly level soils that have a prominent humus layer. These soils

Figure 9.—Slash pines planted on Lakeland sand. Woodland group 4s2.

formed in beds of sand in areas where the water table is high but fluctuating.

In a representative profile, the surface layer is black fine sand about 6 inches thick. The next layer is leached light-gray fine sand about 6 inches thick. It is underlain by a layer stained with organic matter and about 7 inches thick. This stained layer is made up of dark reddish-brown sandy material that, in most places, is weakly cemented, slightly hard when dry, and friable when moist. Fine sand occurs below this stained layer and extends to a depth of 60 inches. It is grayish brown in the upper part, light gray in the middle, and dark gray in the lower part.

These soils are low in natural fertility and organic-matter content. Water moves into the soil rapidly, but the humus layer slows the water movement to a moderately rapid rate. The available water capacity is low. Reaction is extremely acid to strongly acid throughout.

Leon soils are extensive throughout Bryan and Chatham Counties. Some areas have been cultivated but are now forested. The present vegetation consists of longleaf, slash, and pond pines and of low palmetto, gallberries, runner oak, and patches of wiregrass.

Representative profile of Leon fine sand, on Back Trail, about 240 feet east of Red Bird Creek Road, 20 feet north of Back Trail, Bryan County:

A1—0 to 6 inches, black (N 2/0) fine sand; single grain and weak, fine, granular structure; very friable; many small roots; some sand grains lack black coating, and this gives a salt and pepper appearance; extremely acid; clear, wavy boundary.

A2—6 to 12 inches, light-gray (N 7/0) fine sand; single grain; loose; few small roots; thin, mottled, light-gray and dark-brown transitional layer between horizons; very strongly acid; clear, wavy boundary.

B2h—12 to 19 inches, dark reddish-brown (5YR 2/2) fine sand; massive in place breaking to weak, medium, granular structure; friable; common small and me-

dium roots; more than 95 percent of sand grains coated with organic matter; extremely acid; gradual, wavy boundary.

B3—19 to 24 inches, grayish-brown (10YR 5/2) fine sand; single grain; very friable to loose; very strongly acid; gradual, wavy boundary.

C1—24 to 44 inches, light-gray (2.5Y 7/2) fine sand; single grain; loose; very strongly acid; gradual, wavy boundary.

A1b—44 to 60 inches, dark-gray (10YR 4/1) fine sand; single grain; loose; extremely acid.

The A1 horizon is very dark gray to black fine sand as much as 9 inches thick. The A2 horizon ranges from light gray to white. The Bh horizon ranges from very dark brown through dark reddish brown to black. The C horizon is light-gray sand to mottled gray and yellow sand.

Leon soils occur with Olustee, Lynn Haven, Mascotte, Ellabelle, and Chipley soils. They have an A2 horizon 4 to 12 inches thick, whereas Olustee soils have a Bh horizon immediately below the A1 horizon. They lack the clay-enriched horizon that occurs in the Mascotte soils. They are more poorly drained than the Chipley soils. They have a thinner A1 horizon than Lynn Haven soils. They have a Bh horizon, but Pelham and Ellabelle soils do not.

Leon fine sand (Lr).—This soil is poorly drained. Slopes range from 0 to 2 percent.

Included with this soil in mapping are small areas of Olustee, Chipley, and Ellabelle soils.

The seasonal high water table is at a depth of 6 to 15 inches for 1 to 3 months in winter and spring.

This Leon soil, in its natural condition, has little value for farming because it is seasonally wet and also droughty during part of the growing season. If adequately drained and well managed, this soil is fairly well suited to truck crops and bahiagrass for pasture. A few small areas are used for gardens, and a small acreage is in improved pasture. Crops can be grown year after year if management is good. In forested areas, the stand of pines is fairly thin and the trees grow slowly. Capability unit IVw–3; woodland group 4w2.

Lucy Series

The Lucy series consists of well-drained soils that have a thick sandy surface layer over a reddish subsoil. Slopes range from 5 to 12 percent. These soils formed in acid sands and sandy clays.

In a representative profile, the surface layer is dark grayish-brown loamy sand about 7 inches thick. The subsurface layer is light yellowish-brown to brownish-yellow sand and loamy sand about 20 inches thick. The subsoil extends to a depth of about 72 inches and is mainly red sandy clay loam.

Lucy soils are low in natural fertility and organic-matter content. Permeability is moderate. The available water capacity in the uppermost 40 inches is low. Reaction is very strongly acid to strongly acid throughout.

The present vegetation is chiefly loblolly pine mixed with red oak and hickory, but about 20 percent of the acreage is cultivated or pastured. The erosion hazard is moderate because of the slopes. With the use of erosion control practices and cropping systems designed to control runoff, these soils are suited to most of the locally grown crops.

Representative profile of Lucy loamy sand, 5 to 12 percent slopes, one-half mile east of Black Creek on U.S. Highway No. 280, north on paved county road for one-fourth mile, east of roadbank, Bryan County:

A1—0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; many small and large roots; very strongly acid; clear, wavy boundary.

A21—7 to 17 inches, light yellowish-brown (10YR 6/4) sand; weak, fine, granular structure; very friable; many small and large roots; very strongly acid; gradual, wavy boundary.

A22—17 to 22 inches, brownish-yellow (10YR 6/6) and reddish-yellow (7.5YR 6/6) loamy sand; weak, fine, granular structure; very friable; many small and large roots; few small pockets of red material; very strongly acid; clear, smooth boundary.

B21t—22 to 48 inches, red (2.5YR 4/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; few small roots; sand grains bridged with clay; few clean sand grains; very strongly acid; gradual, wavy boundary.

B22t—48 to 72 inches, red (2.5YR 5/8) sandy clay loam; common, medium, prominent, strong-brown (7.5YR 5/8) mottles and few, fine, prominent, light olive-gray (5Y 6/2) mottles; weak, fine, subangular blocky structure; friable; few, fine mica flakes; sand grains bridged with clay; very strongly acid.

The A1 or Ap horizon is dark grayish-brown to grayish-brown loamy sand. The A2 horizon is light yellowish-brown to brownish-yellow loamy sand. The total thickness of the A horizon ranges from about 20 to 36 inches. The B2t horizons are yellowish-red to red sandy clay loam. Few to common clay films occur in some B2t horizons. The weighted average clay content of the upper 20 inches of the B horizon is less than 35 percent and more than 18 percent. It is about 25 percent in most places. The B22t horizon is mottled with strong brown, yellowish brown, pale yellow, and light olive gray in many places.

Lucy soils occur mainly with Lakeland, Fuquay, and Stilson soils. They are less sandy below a depth of 22 inches than the Lakeland soils. They do not contain plinthite in the B horizons, but Fuquay and Stilson soils do.

Lucy loamy sand, 5 to 12 percent slopes (LMD).—This is the only Lucy soil mapped in Bryan and Chatham Counties.

Included with this soil in mapping are small areas of Lakeland and Fuquay soils. Also included are a few small areas that have slopes of 2 to 5 percent and others that have slopes of 15 to 20 percent.

A small acreage is cultivated and pastured; the rest is wooded. The less sloping areas are fairly well suited to cultivated crops, including corn, cotton, peanuts, and soybeans. This soil is also suited to bahiagrass, Coastal bermudagrass, crimson clover, and similar hay and pasture crops. The more sloping areas are better suited to pasture and pine trees than to cultivated crops.

Applications of a complete fertilizer and lime are required for good crops and pasture. Because erosion and droughtiness are hazards where row crops are grown, a cropping system that protects the soil from erosion is needed. A suitable cropping system is 1 or 2 years of corn followed by 2 or more years of grass. Crop residue should be shredded and left on the surface because it aids in conserving moisture and controlling erosion. Capability unit IVs–1; woodland group 3s2.

Lynn Haven Series

The Lynn Haven series consists of nearly level, poorly drained, sandy soils that occur in ponded or extremely wet areas.

In a representative profile, the surface layer is black sand about 20 inches thick. Below this is a layer of dark reddish-brown, stained sand humus about 16 inches thick. It is underlain by dark-brown sand that extends to a depth of 60 inches.

Lynn Haven soils are low in natural fertility and medium in organic-matter content. The available water capacity is low, and permeability is moderately rapid to moderate. These soils are extremely acid to strongly acid.

These soils are not extensive and occur as scattered areas, mostly in the eastern parts of the survey area. Most of the acreage is wooded, and the rest is used mostly for pasture. The present vegetation is mixed loblolly or pond pine, blackgum, bay, and sweetgum, and an understory of bracken fern and fedder bush. The high water table and hazard of flooding make this soil poorly suited to cultivation. Drained areas are suited to pine trees, permanent pasture, and selected truck crops.

Representative profile of Lynn Haven sand, about 2.7 miles south of Keller, 0.6 mile east of State Route 67, 1.0 mile north on Jake Brown Road, and 0.4 mile east on Smith Road, 50 feet north of road, Bryan County:

A1—0 to 20 inches, black (10YR 2/1) sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; gradual, wavy boundary.

B2h 20 to 36 inches, dark reddish-brown (5YR 3/2) sand; massive; friable; few large roots; very strongly acid; gradual, wavy boundary.

B3—36 to 60 inches, dark-brown (7.5YR 3/2) sand; single grain; loose; very strongly acid.

The black A1 horizon is typically about 20 inches thick, but it ranges from 10 to about 20 inches in thickness. A few areas have an A2 horizon that is gray to light gray and about 8 inches thick. Depth to the B2h layer is about 20 inches but ranges from 10 inches to as much as 30 inches. In some areas a grayish-brown to light grayish-brown C horizon occurs above a depth of 60 inches. This layer grades into a very dark brown layer in some places.

In most places in the survey area, Lynn Haven soils lack a leached A2 horizon and therefore are slightly outside of the defined range for the Lynn Haven series. They are, however, enough like the typical Lynn Haven soils in morphology, composition, and behavior that a new series is not warranted.

Lynn Haven soils occur mainly with Leon, Chipley, and Ellabelle soils. They are wetter and have a thicker, black A1 horizon than Chipley soils, which lack a Bh layer. They have a thicker A1 horizon than Leon soils and less clay in the B horizon than the Ellabelle soils, which lack a Bh layer.

Lynn Haven sand (lQ).—This soil is the only Lynn Haven soil mapped in the survey area. Slopes range from 0 to about 2 percent.

Included with this soil in mapping are small areas of Chipley, Ellabelle, and Leon soils.

Most of the acreage is wooded, but a small part is pastured. This soil has only limited use for farming. The water table is near the surface during wet periods in winter and spring, but it drops in the summer. For this reason, the soil is somewhat droughty during parts of the growing season.

Wetness limits the suitability of this soil mainly to pasture and trees, but where drainage is adequate, selected truck crops and bahiagrass for pasture can be grown. Drainage also improves the growth of pine trees. Capability unit IVw 3; woodland group 4w3.

Made Land

Made land (Mae) consists of built-up areas that were formerly marshland. These areas were made by dumping material dredged from the coastal streams, mainly along the Savannah River shipping channel and harbor. In some areas the material is confined by dikes. Areas of considerable size occur across the river from Savannah. Also, small areas are along the intercoastal waterway that crosses the survey area north and south.

The material ranges from coarse sand to clay and, in some places, is stratified with layers of varying thickness. Closest to the dumping point, texture is coarser and the material is stratified. As the distance from the dumping point increases, the texture becomes finer. The sandy material is dark brown to brownish yellow. The clayey material is black to dark yellowish brown. In artificially drained areas where texture is clay to silty clay loam, cracks form in some places as the material dries out. These cracks are as much as 3 or 4 inches wide. Also, the surface subsides as much as 12 inches in some places.

The organic-matter content is medium to high where these soils are fine textured. In some areas the material contains enough sulfur to cause the pH to drop below 4.0. More than normal amounts of lime are needed in these areas to raise the pH enough for good plant growth. This highly acid condition normally occurs in areas of an acre or less in size.

About 400 acres on Hutchinson Island is cultivated, and the rest is not used. The vegetation is fairly variable and ranges from shrubs to weeds and grasses. In clayey areas excess water is a limitation, whereas the sandy areas are droughty. Capability unit VIIw–3; not assigned to a woodland group.

Mascotte Series

The Mascotte series consists of poorly drained soils on broad, low ridges and in fringe areas adjacent to wet depressions. The areas are slightly convex. Slopes are less than 2 percent.

In a representative profile, the surface layer is very dark gray sand about 8 inches thick. The subsurface layer is light-gray sand about 10 inches thick. The next layer is black sand about 4 inches thick. Sand is below this layer and extends to a depth of about 38 inches. It is yellowish brown in the upper part and light gray in the lower part. The next layers extend to a depth of 60 inches and are light-gray sandy loam and sandy clay loam.

These soils are low in natural fertility and organic-matter content. They are very strongly acid to strongly acid. The available water capacity is low, and permeability is moderate. The seasonal high water table is at a depth of 15 to 30 inches for 2 to 6 months each year and restricts the growth of roots of some plants.

Mascotte soils are extensive and are scattered throughout Bryan and Chatham Counties, except in the eastern part. About 90 percent of the acreage is wooded, and some of the rest is used for pasture and community development. The present vegetation is chiefly slash and longleaf pines and an understory of saw-palmetto, cudjoe wood, and gallberries.

Representative profile of Mascotte sand, about 2 miles east of Lanier and 1.3 miles south of State Route 204, ditchbank on east side of road, Bryan County:

A1—0 to 8 inches, very dark gray (10YR 3/1) sand; weak, fine, granular structure; very friable; many small and large roots; strongly acid; clear, smooth boundary.

A2—8 to 18 inches, light-gray (10YR 7/1) sand; single grain; loose; many small and large roots; very strongly acid; abrupt, smooth boundary.

B2h—18 to 22 inches, black (10YR 2/1) sand; common, medium, distinct, dark reddish-brown (5YR 3/2) mottles; massive in place breaking to weak, medium, angular blocky structure; firm; common small and medium roots; very strongly acid; clear, wavy boundary.

B3—22 to 30 inches, yellowish-brown (10YR 5/4) sand; common, medium, faint, dark yellowish-brown (10YR 4/4) mottles and few, fine, prominent, dark reddish-brown (5YR 2/2) humus mosses; weak, fine, granular structure; very friable; few small and medium roots; very strongly acid; gradual, wavy boundary.

A'2—30 to 38 inches, light-gray (2.5Y 7/2) sand; single grain; loose; very strongly acid; gradual, wavy boundary.

B'1g —38 to 42 inches, light-gray (5Y 7/2) sandy loam; common, medium, prominent, brownish-yellow (10YR 6/8) mottles and few, fine, prominent, strong-brown (7.5YR 5/8) mottles; weak, very fine, subangular blocky structure; firm; few sand grains bridged with clay; very strongly acid; gradual, wavy boundary.

B'2g —42 to 60 inches, light-gray (10YR 7/1) sandy clay loam; common, fine, prominent, yellowish-brown (10YR 5/8) mottles; weak, fine, subangular blocky structure; firm; very strongly acid.

The A1 horizon ranges from dark gray to black. It is typically about 8 inches thick but is as thin as 4 inches in places. The A2 horizon is light gray to white and ranges from 6 to 10 inches in thickness. The Bh horizon is black to dark brown and about 4 to 8 inches thick. Depth to the B'1g horizon is about 30 to 38 inches. The B'2g horizon is sandy clay loam or coarse sandy clay loam.

Mascotte soils are associated with Olustee, Ocilla, Stilson, Ogeechee, and Pelham soils. They have an A2 horizon more than 2 inches thick between the A1 and B2h horizons, whereas Olustee soils have a Bh horizon immediately below the A1 horizon. They are more poorly drained than Ocilla and Stilson soils. They have a Bh layer stained with organic matter, which Pelham and Ogeechee soils do not have.

Mascotte sand (Mn).—This soil is poorly drained. It occurs on slight ridges and in areas bordering depressions, drainageways, and bays. Slopes generally are less than 2 percent.

Included with this soil in mapping are small areas of Olustee, Albany, Ocilla, and Pelham soils. Also included are small areas of a Mascotte soil that has a coarse sand surface layer.

This soil has limited suitability for cultivated crops. The high water table is seasonally close to the surface, but during dry periods, plant growth is slowed by a lack of water because the available water capacity is low. The layer stained with organic matter is firm to hard when dry, and it tends to impede root penetration. Adapted truck crops can be grown season after season if this soil is drained and managed well. This soil is better suited to pasture plants, such as bahiagrass, and to pine trees than to cultivated crops.

Almost all of the acreage is wooded. This soil is suited to trees even though the site index for pines is much less than that of adjacent soils. Capability unit IIIw 4; woodland group 3w2.

Meggett Series

The Meggett series consists of poorly drained soils that formed mainly in alkaline clay and sandy clay on the lower marine terraces. These soils occur in small, scattered areas in drainageways and on flats at the lower elevations. Slopes range from 0 to about 2 percent.

In a representative profile, the surface layer is black loam about 6 inches thick. The subsurface layer is dark-gray fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches and consists of gray sandy clay and clay. The seasonal high water table is close to the surface for long periods, and some areas are subject to flooding.

These soils are normally high in content of calcium, medium in phosphate, and low in other plant nutrients. The organic-matter content is low. The soils are medium acid to mildly alkaline. Permeability is slow, and the available water capacity is medium.

Most of the acreage is wooded. The present vegetation is mixed loblolly pine, sweetgum, water oak, and blackgum and an understory of cabbage palmetto and waxmyrtle.

Representative profile of Meggett loam, 0.6 mile west of junction of U.S. Highway No. 80 and State Route 307 (Dean Forest Road), 100 feet south of U.S. Highway No. 80 in wooded area, Chatham County:

A1—0 to 6 inches, black (10YR 2/1) loam; weak, fine, granular structure; very friable; many small and medium roots; medium acid; clear, wavy boundary.

A2—6 to 12 inches, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; very friable; many small and medium roots; medium acid; abrupt, smooth boundary.

B21tg—12 to 24 inches, gray (10YR 5/1) sandy clay; few, fine, distinct, olive-yellow (2.5Y 6/6) mottles; moderate, medium, subangular blocky structure; very firm; few small roots; clay films on some ped surfaces; slightly acid; gradual, wavy boundary.

B22tg—24 to 32 inches, gray (5Y 5/1) sandy clay; few, fine, prominent, brownish-yellow (10YR 6/8) mottles; moderate, medium, angular blocky structure; very firm; few small roots; clay films on some ped surfaces; neutral; gradual, wavy boundary.

B23tg—32 to 46 inches, gray (5Y 6/1) clay; few, medium, prominent, yellowish-brown (10YR 5/8) mottles; strong, medium, angular blocky structure; very firm; clay films on some ped surfaces; neutral; gradual, wavy boundary.

B3g—46 to 60 inches, gray (5Y 6/1) sandy clay; few, medium, prominent, yellowish-brown (10YR 5/8) mottles; weak, coarse, subangular blocky structure; very firm; mildly alkaline.

The A1 horizon is very dark gray to black loam 4 to 6 inches thick. The A2 horizon is sandy loam or fine sandy loam and dark gray to very dark grayish brown in color. The B2tg horizons are dark gray to light gray mottled with olive yellow to yellowish brown. The weighted average clay content of the upper 20 inches of the B horizon is typically about 38 percent and ranges from about 35 to about 45 percent. The B3g horizon is sandy clay to sandy clay loam, and some pedons have pockets of sand and clay. Lime concretions as much as one-half inch in size occur in some profiles below a depth of about 32 to 46 inches. In some profiles, partly decomposed oyster shell fragments are also in the B3g horizon.

Meggett soils occur with Pooler, Cape Fear, and Ogeechee soils. They are medium acid to neutral in the upper part of the profile and neutral to alkaline in the lower part, whereas the associated soils are very strongly acid to strongly acid. They have less sand in the B horizon than Ogeechee soils, and their A1 horizon is not so thick as the very dark gray A1 horizon of Cape Fear soils.

Meggett loam (Mbc).—This soil is poorly drained. It occurs in depressions and drainageways and is subject to flooding during wet periods.

Included with this soil in mapping are small areas of Pooler, Cape Fear, and Ogeechee soils.

Most of the acreage is covered by hardwood trees and a few scattered pines. The few small areas that have been cleared are idle or in native grasses.

This soil is not suited to cultivated crops, but pasture plants grow well where managed intensively. The management should include draining and adding fertilizer and lime in amounts needed. If managed properly, this soil is suited to bahiagrass, dallisgrass, and white clover. It is also suited to trees. Capability unit Vw–1; woodland group 1w9.

Ocilla Series

The Ocilla series consists of somewhat poorly drained soils that formed mainly in loamy marine material. These soils are on slightly undulating ridges in the middle of the two counties. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is very dark gray loamy fine sand about 6 inches thick. The subsurface layer is about 16 inches of loamy fine sand and fine sand that is grayish brown in the upper part and pale olive in the lower part. The subsoil extends to a depth of about 60 inches and is sandy clay loam. It is light olive brown mottled with shades of gray and brown in the upper part and light brownish gray mottled with shades of brown and red in the lower part.

These soils are low in organic-matter content and natural fertility. They are very strongly acid throughout. The available water capacity is low to medium. Permeability is moderate.

Ocilla soils are extensive in Bryan and Chatham Counties. The native vegetation is chiefly loblolly pine, and there are some hardwoods such as red oak and hickory. An understory of waxmyrtle and gallberry or yaupon grows in most areas. A dense stand of loblolly pine grows in most abandoned fields.

If water is controlled, Ocilla soils are well suited to truck crops and pasture. They are suited to pine trees under natural conditions. Most of the acreage is wooded.

Representative profile of an Ocilla loamy fine sand, 0.6 mile west of State Route 21 and about one-fourth mile east of Travis Field, 50 feet south of Bourne Avenue, Chatham County:

A1—0 to 6 inches, very dark gray (10YR 3/1) loamy fine sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; clear, smooth boundary.

A21—6 to 11 inches, grayish-brown (2.5Y 5/2) loamy fine sand; weak, medium, granular structure; very friable; few small roots; very strongly acid; gradual, wavy boundary.

A22—11 to 22 inches, pale-olive (5Y 6/3) fine sand; few, fine, faint, light-olive brown mottles; weak, medium, granular structure; very friable; few small roots; very strongly acid; clear, smooth boundary.

B1t—22 to 27 inches, light olive-brown (2.5Y 5/4) sandy clay loam; common, medium, distinct, light-gray (2.5Y 7/2) and yellowish-brown (10YR 5/8) mottles; weak, fine, subangular blocky structure; friable; very strongly acid; gradual, wavy boundary.

B2tg—27 to 46 inches, light brownish-gray (2.5Y 6/2) sandy clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, prominent, red (10R 4/6) mottles; moderate, fine, subangular and angular blocky structure; firm; clay on some ped surfaces; very strongly acid; gradual, wavy boundary.

B3g—46 to 60 inches, light brownish-gray (2.5Y 6/2) sandy clay loam; many, coarse, prominent, yellowish-red (5YR 4/8) mottles and few, medium, prominent, red (2.5YR 4/8) mottles; weak, coarse, subangular blocky structure; firm; very strongly acid.

The A1 horizon ranges from very dark gray to dark grayish brown. The leached A2 horizon is light yellowish brown to grayish brown. Depth to the B1t horizon ranges from 20 to 40 inches and is about 24 inches in most places. The B1t horizon is mostly light olive brown to yellowish brown. Light-gray mottles are at the top of the sandy clay loam B1t horizon and increase in number as depth increases. The B2tg horizon is coarsely mottled with shades of gray, brown, and red.

Ocilla soils occur mainly with the Ellabelle, Pelham, Craven, and Albany soils. They are not so poorly drained nor so gray as Pelham and Ellabelle soils. They are wetter and contain less clay in the subsoil than Craven soils. They have a thinner A horizon than the Albany soils.

Ocilla complex (Oj).—This complex is on slight ridges. Slopes range from 0 to about 2 percent. The complex consists chiefly of Ocilla soils, but a small part is included soils. The Ocilla soils mainly have the profile described as representative for the series.

Included in mapping are areas of Pelham and Ellabelle soils. Also included are soils that have a thinner solum or a clayey subsoil but are otherwise similar to Ocilla soils.

Tilth is good, but during wet periods the water table is about 15 to 30 inches below the surface.

Only a small acreage is cultivated or pastured. The rest is wooded. This complex is suited to such crops as corn, soybeans, tobacco, and truck crops and to Coastal bermudagrass and bahiagrass for hay and pasture. Crops respond well to fertilizer and lime, but drainage is needed for most row crops. Drainage can be by open ditches, bedding, leveling and shaping, or tile lines. Drainage is especially needed where tobacco is grown.

Erosion is not a hazard, and row crops can be grown year after year if management is good. Capability unit IIIw–1; woodland group 3w2.

Ocilla-Urban land complex (Ojc).—This complex occurs in somewhat poorly drained areas above the flats and along drainageways. It is in populated and industrial areas around Savannah and in adjoining towns and communities. The complex is 40 to 60 percent Ocilla soils and 20 to 30 percent Urban land. The rest is Albany, Pelham, Ogeechee, and Wahee soils. The composition of the mapped areas varies somewhat. In undisturbed areas the Ocilla soils have a profile similar to the one described as representative for the series.

Urban land consists mainly of sites for houses, industrial buildings, parking lots, streets, and other structures that accompany community development. Because the landscape has been altered by cutting, filling, grading, and shaping, identification of soils in this part of the complex is impractical. Capability unit IIIw–1; not assigned to a woodland group.

Ogeechee Series

The Ogeechee series consists of somewhat poorly drained soils on broad flats, in depressions, and in some

drainageways. These soils formed mainly in loamy materials on low marine terraces. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is very dark gray loamy fine sand about 8 inches thick. Below the surface layer, to a depth more than 60 inches, are layers of sandy clay loam and sandy clay. They are dark grayish brown in the upper part and grayish brown in the lower part, and they are mottled with shades of brown.

Ogeechee soils are low in organic-matter content and natural fertility. They are strongly acid to very strongly acid. Permeability is moderately slow, and the available water capacity is medium. The high water table is near the surface for long periods and limits the depth that the roots of some plants penetrate.

Ogeechee soils are extensive in the survey area. The native vegetation is chiefly loblolly and slash pines, and there are some blackgum, sweetgum, cypress, and bay. An understory of waxmyrtle and wiregrass or native grasses grows in most places. These soils are well suited to loblolly and slash pines where excess surface water is removed. Excess water is a severe limitation to cultivation. Most of the cleared acreage, which is a small part of the total acreage, is used for pasture.

Representative profile of Ogeechee loamy fine sand, north of Bryan-Liberty County line along U.S. Highway No. 17 to Jones Loop Road, east on Jones Loop Road to Mount Hope Road, south on Mount Hope Road for about 1.2 miles, about 100 yards west of end of Mount Hope Road, and 50 feet west of canal, Bryan County:

A1—0 to 8 inches, very dark gray (10YR 3/1) loamy fine sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; clear, smooth boundary.

B1tg—8 to 23 inches, dark grayish-brown (10YR 4/2) sandy clay loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; common small roots; very strongly acid; gradual, wavy boundary.

B2tg—23 to 42 inches, dark grayish-brown (10YR 4/2) sandy clay; many, medium, prominent, strong-brown (7.5YR 5/6) mottles; moderate, fine, subangular blocky structure; firm; very strongly acid; gradual, wavy boundary.

B3tg—42 to 60 inches, grayish-brown (10YR 5/2) sandy clay loam; many, medium, prominent, strong-brown (7.5YR 5/6) mottles and few, fine, distinct, light olive-brown (2.5Y 5/4) mottles; weak, fine, subangular blocky structure; firm; very strongly acid.

The sandy A horizon ranges from 6 to about 20 inches in thickness and is typically less than 10 inches thick. It is very dark gray to black. The B horizon ranges from sandy clay loam to sandy clay. Sandy lenses occur in the B3g horizon and, in some areas, in the B2tg horizon. Mottles in the B1tg horizon are typically yellowish brown but range to strong brown in the B2tg and B3tg horizons. The weighted average clay content of the upper 20 inches of the B horizon ranges from 18 to 35 percent, but the range is 25 to 35 percent in most places.

Ogeechee soils are mainly associated with Pelham, Ocilla, Ellabelle, Cape Fear, and Wahee soils. They have a thinner A1 horizon than and are not so wet as Ellabelle and Cape Fear soils. They lack the thick sandy A horizon of Pelham soils. They are slightly wetter than Wahee and Ocilla soils, though the soils of all three series are somewhat poorly drained.

Ogeechee loamy fine sand (Ok).—This soil occurs on broad flats, in depressions, and in drainageways. It has the profile described as representative for the Ogeechee series. Slopes range from 0 to 2 percent. Depressional areas are ponded or flooded during wet periods.

Included with this soil in mapping are areas of Cape Fear, Ellabelle, and Wahee soils.

Most of the acreage is wooded, and the rest is pastured or urban. The suitability of this soil for most uses is limited by wetness. If adequately drained, this soil is fairly well suited to corn and similar cultivated crops, and it can be cultivated year after year under good management. This soil, however, is better suited to white clover, bahiagrass, and pine trees. Drainage practices that help remove excess water are digging open ditches, bedding, leveling, and shaping. Areas in depressional drainageways need protection from stream overflow if they are to be pastured or cultivated.

Most crops respond well to fertilizer and lime. If this soil is cultivated, crop residue should be worked into the soil to maintain organic-matter content and good tilth. Capability unit IIIw–5; woodland group 2w3.

Ogeechee-Urban land complex (Okc).—This complex is 40 to 60 percent Ogeechee soils and 20 to 40 percent Urban land. The rest is Pelham, Ocilla, and Ellabelle soils. The complex occurs in level wet areas. The composition of most mapped areas is in about the same proportion from place to place. In undisturbed areas the profile of the Ogeechee soils is similar to that described for the series, but the very dark gray loamy fine sand surface layer is about 6 to 20 inches thick.

Urban land consists mainly of sites for houses, industrial buildings, parking lots, streets, and other structures that accompany community development. In many places the landscape has been altered by cutting, filling, grading, and shaping. Identification of the soils in Urban land is impractical because they are obscured by works and structures (fig. 10).

This complex is mapped only in the populated and industrial areas around Savannah and adjoining towns and communities. Capability unit IIIw–5; not assigned to a woodland group.

Olustee Series

The Olustee series consists of poorly drained soils of the lower Coastal Plain. These soils are level to nearly level. They are in areas above the broad flats, drainageways, and ponds.

In a representative profile, the surface layer is very dark gray fine sand about 6 inches thick. Below the surface layer is friable, very dark brown and dark yellowish-brown fine sand that is about 5 inches thick and is stained by organic matter. The next layer is fine sand about 21 inches thick. It is pale brown in the upper part and pale olive in the lower part, and it is mottled with shades of brown and gray. Gray sandy clay loam mottled with yellowish brown and strong brown is below this layer and extends to a depth of 60 inches.

These soils are low in natural fertility and organic-matter content. They are strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is low.

Most of the acreage is wooded, and a small acreage is cultivated or used for pasture. The present vegetation is

Figure 10.—**Housing development on Ogeechee-Urban land complex. The drainage system is between the streets.**

chiefly loblolly or slash pine, and the understory is waxmyrtle, gallberries, and yaupon.

Representative profile of Olustee fine sand, 0.6 mile east of Richmond Hill city limits on State Route 67, 75 feet north of State Route 67, Bryan County:

A1—0 to 6 inches, very dark gray (N 3/0) fine sand; weak, fine, subangular blocky structure; very friable; many small roots; common clean sand grains; very strongly acid; clear, smooth boundary.

B2h -6 to 11 inches, very dark brown (10YR 2/2) and dark yellowish-brown (10YR 4/4) fine sand; few, medium, distinct, gray (N 5/0) mottles; weak, coarse, subangular blocky structure; friable; few small roots; very strongly acid; gradual, wavy boundary.

A'21 11 to 21 inches, pale-brown (10YR 6/3) fine sand; common, fine, distinct, light yellowish brown (2.5Y 6/4) and light brownish-gray (2.5Y 6/2) mottles; weak, fine, granular structure; very friable; very strongly acid; gradual, wavy boundary.

A'22—21 to 32 inches, pale-olive (5Y 6/3) fine sand; few, fine, prominent, yellowish-brown (10YR 5/8) mottles and few, fine, faint, gray mottles; single grain; loose; very strongly acid; clear, wavy boundary.

B'2tg—32 to 46 inches, gray (10YR 6/1) sandy clay loam; common, fine, distinct, yellowish-brown (10YR 5/8) mottles; weak, fine, subangular blocky structure; firm; clay bridging of sand grains; very strongly acid; gradual, wavy boundary.

B'3tg—46 to 60 inches, gray (10YR 6/1) sandy clay loam; many, medium, prominent, strong-brown (7.5YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; clay bridging of sand grains; strongly acid.

The A1 horizon is very dark gray to black and 6 to 7 inches thick. The Bh horizon is dark yellowish brown to dark reddish brown and very dark brown and is typically friable. It is about 4 to 7 inches thick. The sandy A'2 horizons are pale brown or pale olive mottled with yellowish brown and light brownish gray. The B'2t horizon is typically sandy clay loam but ranges to sandy loam. It is light gray to light brownish gray mottled with brownish yellow to strong brown.

Olustee soils occur mainly with Mascotte, Leon, Ocilla, and Stilson soils. They lack the light-gray A2 horizon be-

tween the surface layer and the Bh horizon that is in the Mascotte and Leon soils. They have a very dark brown Bh horizon, but the Ocilla and Stilson soils do not.

Olustee fine sand (Ol).—This soil is poorly drained. Slopes range from 0 to about 2 percent.

Included with this soil in mapping are small areas of Ocilla, Stilson, Leon, and Mascotte soils.

Most of the acreage is wooded, but a small part is cultivated or pastured. Tilth is good.

This soil is suited to such crops as corn, soybeans, tobacco, and truck crops and to such pasture plants as Coastal bermudagrass and bahiagrass. These crops respond well where drainage is adequate and fertilizer and lime are added. Drainage can be by open ditches, bedding, leveling and shaping, and tile lines. Drainage is especially desirable where tobacco is grown. Erosion is not a hazard.

Row crops can be grown year after year if adequate fertilizer and lime are added, drainage is adequate, and plant residue is returned to the soil. Capability unit IIIw–1; woodland group 3w2.

Osier Series

The Osier series consists of poorly drained sandy soils on Tybee, Wassaw, and Ossabaw Islands. These soils are mainly nearly level, but in places they occur as depressions. They are ponded at times.

In a representative profile, the surface layer is very dark gray fine sand about 4 inches thick. Below this layer, to a depth of 60 inches, is fine sand. It is light brownish gray in the upper part, mottled light gray in the middle, and greenish gray in the lower part. The seasonal high water table is less than 6 inches below the surface for extended periods.

Osier soils are low in natural fertility and organic-matter content. They are strongly acid in the upper part, but range to moderately alkaline in the lower part. Permeability is rapid. The available water capacity is very low, though the water table is near the surface for significant periods.

Osier soils are not extensive in the survey area. All of the acreage is wooded. The present vegetation is mixed loblolly pine, live oak, cedar, cabbage palmetto, and waxmyrtle.

Representative profile of Osier fine sand on Wassaw Island, about 1,000 feet east of highest dune on island, 25 feet south of House-Beach Road, Chatham County:

A1—0 to 4 inches, very dark gray (10YR 3/1) fine sand; weak, fine, granular structure; very friable; common, small, black sand grains; many small roots; strongly acid; clear, smooth boundary.

C1—4 to 16 inches, light brownish-gray (2.5Y 6/2) fine sand; single grain; loose; common, small, black sand grains; slightly acid; gradual, wavy boundary.

C2—16 to 30 inches, light-gray (2.5Y 7/2) fine sand; few, medium, prominent, dark-brown (7.5YR 4/4) mottles; single grain; loose; many black sand grains; mildly alkaline; gradual, wavy boundary.

C3—30 to 60 inches, greenish-gray (5GY 5/1) fine sand; single grain; loose; many black sand grains; moderately alkaline.

The A1 horizon is very dark gray to dark gray. The C horizons are light brownish gray, light gray, dark gray, or greenish gray and are mottled with brown in some places. In places few small marine shell fragments are in these layers.

Because reaction in the lower layers ranges from slightly acid to moderately alkaline, Osier soils mapped in the survey area are slightly outside the range defined for the Osier series. Osier soils in the survey area are so similar to the typical Osier soils in morphology, composition, and behavior that a new series is not warranted.

Osier soils are associated with Kershaw soils, Tidal marsh, salty, and Coastal beach. They are more poorly drained than Kershaw soils and Coastal beach. They have less silt and clay throughout the profile than Tidal marsh, salty.

Osier fine sand (Om).—This soil is poorly drained. The water table is within 15 inches of the surface for 3 to 6 months of the year.

Included with this soil in mapping are small areas of Kershaw soils, Tidal marsh, salty, and Coastal beach.

This soil is not suited to cultivated crops and only fairly well suited to pasture. Pasture plants require surface drainage to remove excess water during wet periods, and protection from tidal flooding is needed in most areas. Fertilizer should be applied as needed.

This soil is better suited to trees than to pasture. All of the acreage is wooded. Trees that grow near beaches may be damaged by the salt spray blown in by high winds. Capability unit Vw–3; woodland group 3w3.

Pelham Series

The Pelham series consists of poorly drained, nearly level soils. These soils occur in drainageways, on flats, and in depressions throughout most of Bryan and Chatham Counties. They formed in sand and loamy materials. Slopes are less than 2 percent.

In a representative profile, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is about 17 inches thick and consists of dark-gray and gray loamy sand. The subsoil extends to a depth of about 60 inches and is mainly sandy loam, sandy clay, and sandy clay loam. It is light gray in the upper part and gray mottled with brownish yellow and light olive brown in the lower part.

Pelham soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. Permeability is moderate, and the available water capacity is low to medium.

Most of the acreage is wooded, and only a small part is used for pasture. On broad flats the native vegetation is slash or loblolly pine and an understory of gallberry and waxmyrtle. In ponded areas and drainageways, the native vegetation is mixed pines and hardwoods and an understory of waxmyrtle. Poor drainage and excess water limit the suitability of Pelham soils for cultivated crops and pasture. These soils are suited to trees.

Representative profile of Pelham loamy sand, about 3 miles northeast of Pembroke on State Route 119, 200 feet west of highway and 15 feet north of unpaved road, Bryan County:

A1—0 to 7 inches, very dark gray (N 3/0) loamy sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; clear, smooth boundary.

A2—7 to 24 inches, dark-gray (5Y 4/1) and gray (5Y 6/1) loamy sand; single grain; loose; many small roots; very strongly acid; clear, smooth boundary.

B1g—24 to 28 inches, light-gray (5Y 7/2) sandy loam; weak, fine, subangular blocky structure; friable; common

small roots; very strongly acid; gradual, wavy boundary.

B2tg—28 to 40 inches, gray (5Y 5/1) sandy clay; pockets of sandy clay loam and sandy loam; common, fine, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; firm; very strongly acid; gradual, wavy boundary.

B3tg—40 to 60 inches, gray (N 5/0) mixed sandy clay, sandy clay loam, and sandy loam; common, medium, light olive brown (2.5Y 5/6) mottles; weak, fine, granular structure; firm and friable; very strongly acid.

The A1 horizon is black to dark-gray loamy sand. The A2 horizon is dark-gray to light-gray loamy sand. The total thickness of the A horizon ranges from 21 to 30 inches, but is 26 inches in most places. As depth increases, the B horizon grades from sandy loam to sandy clay loam or sandy clay. It is light gray to dark gray mottled with olive brown, yellowish brown, and in places, red.

Pelham soils commonly occur with Ellabelle, Ocilla, Stilson, and Albany soils. They have a thinner A1 horizon than Ellabelle soils. They are more poorly drained than Ocilla, Stilson, and Albany soils.

Pelham loamy sand (Pl).—This soil has slopes that range from 0 to 2 percent.

Included with this soil in mapping are areas of Ellabelle, Ocilla, and Stilson soils. Also included are soils similar to Pelham soils except that their solum is thinner.

The seasonal high water table is within 6 inches of the surface for several months each year. Areas in drainageways are subject to frequent flooding by adjacent streams, and ponded areas without an outlet may have excess water on the surface for extended periods.

Artificially drained areas not subject to flooding are suitable for limited use for pasture and some cultivated crops. Suitable plants are corn, white clover, and bahiagrass. This soil can be cultivated year after year under good management. Crop residue worked into the soil helps to maintain organic-matter content and good tilth. Suitable drainage practices are use of open drains, bedding, and tile lines.

This soil is suited to pine trees. Capability unit IVw–4; woodland group 2w3.

Pooler Series

The Pooler series consist of gray, somewhat poorly drained soils in low-lying areas. Runoff is slow or ponded because these soils are level or nearly level. They formed from acid marine clay. Slopes range from 0 to about 2 percent.

In a representative profile, the surface layer is very dark gray fine sandy loam about 5 inches thick. Mainly clay lies below the surface layer and extends to a depth of about 60 inches. It is grayish brown in the upper part and light brownish gray and light olive brown in the lower part, and it is mottled with shades of red, brown, and gray.

These soils are low in natural fertility and organic-matter content. They are strongly acid to very strongly acid. Permeability is slow, and the available water capacity is medium.

Most of the acreage of Pooler soils is wooded, and a small part is in pasture. The native vegetation is mixed loblolly pine and water oak and some blackgum and sweetgum.

Representative profile of Pooler fine sandy loam, about 2.2 miles south of the Effingham County line on State Route 21 and 0.5 mile west of State Route 21, in south ditchbank of unpaved road, Chatham County:

A1—0 to 5 inches, very dark gray (10YR 3/1) fine sandy loam; moderate, fine, granular structure; friable; many small roots; very strongly acid; abrupt, smooth boundary.

B21tg—5 to 21 inches, grayish-brown (10YR 5/2) clay; many, fine, prominent, red (2.5YR 4/6) mottles; strong, fine and medium, subangular blocky structure; very firm; common small roots on ped surfaces; clay films on most ped surfaces; very strongly acid; gradual, wavy boundary.

B22tg—21 to 34 inches, grayish-brown (2.5Y 5/2) clay; many, fine and medium, prominent, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; very firm; clay films on most ped surfaces; very strongly acid; gradual, wavy boundary.

B23tg—34 to 46 inches, light brownish-gray (2.5Y 6/2) clay; common, coarse, distinct, light olive-brown (2.5Y 5/4) mottles; moderate, fine, subangular blocky structure; very firm; few clay films on some ped surfaces; very strongly acid; gradual, wavy boundary.

B3—46 to 60 inches, light olive-brown (2.5Y 5/4) coarse sandy clay loam and clay; few, fine, prominent, strong-brown (7.5YR 5/6) mottles and few, coarse, distinct, light brownish-gray (2.5Y 6/2) mottles; weak, coarse, subangular blocky structure; firm; very strongly acid.

The A1 horizon ranges from very dark gray to dark grayish brown in color and from 4 to 6 inches in thickness. It is sandy loam. The weighted average clay content of the upper 20 inches of the B horizon is more than 35 percent, and it ranges to about 45 percent in most areas. The B21tg horizon is gray to dark gray mottled with yellowish brown to red. The B2tg horizon is sandy clay to clay below a depth of 36 to 40 inches. Sand content increases with depth. In some profiles coarse sand makes up the major part of the sand fraction in the B3 horizon.

Pooler soils occur mainly with Cape Fear, Ogeechee, Wahee, and Ellabelle soils. In the Pooler soils, the dark A1 horizon is not so thick as the A1 horizon of the Cape Fear and Ellabelle soils. Pooler soils have more clay in the B horizons than the Ogeechee soils. They are grayer in the upper part of the profile than are Wahee soils.

Pooler fine sandy loam (Pn).—This soil occurs on broad flats. Some mapped areas have depressions that range from about one-tenth acre to 3 acres in size. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Ogeechee, Wahee, and Cape Fear soils.

The surface layer has fair to good tilth, but deep plowing mixes the surface layer and clayey subsoil and is detrimental to good tilth. The seasonal high water table is within 12 inches of the surface for as much as 6 months or more per year (fig. 11).

Most of the acreage is wooded, and a few areas are idle or in pasture. This soil is not suited to cultivated crops, but bahiagrass, dallisgrass, and white clover grow fairly well if management is intensive. Management should include surface drainage and adding fertilizer and lime as needed. Subsurface drainage is not so effective.

Loblolly and slash pines are suited if this soil is drained. Capability unit Vw–1; woodland group 2w9.

Stilson Series

The Stilson series consists of level to very gently sloping, moderately well drained soils on ridges. These soils formed in loamy materials on marine terraces.

Figure 11.—**Shallow water table in Pooler fine sandy loam.**

In a representative profile, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer, about 19 inches thick, is loamy sand that is olive in the upper part and light yellowish brown in the lower part. The subsoil extends to a depth of 60 inches and consists of sandy loam and sandy clay loam. It is olive yellow in the upper part and pale brown in the lower part, and it is mottled with shades of brown, gray, olive, and red.

These soils are low in natural fertility and organic-matter content. They are very strongly acid to strongly acid throughout. Permeability is moderate, and the available water capacity is low to medium.

Stilson soils are extensive and occur only in Bryan County. They are the most intensively cultivated soils in the survey area. About 25 percent of the acreage is cultivated or in pasture. Most of the acreage is wooded. The main trees are slash and longleaf pines, and the understory is gallberries and waxmyrtle. In places the ground cover is wiregrass. Stilson soils are well suited to most locally grown crops, and crops respond well to good management.

Representative profile of Stilson loamy sand, about 1.7 miles northwest of Beautiful Zion Baptist Church, then north on dirt road 0.8 mile, 50 feet east of road, Bryan County:

A1—0 to 6 inches, very dark gray (10YR 3/1) loamy sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; clear, smooth boundary.

A21—6 to 13 inches, olive (5Y 5/3) loamy sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; gradual, wavy boundary.

A22—13 to 25 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; many small roots; very strongly acid; gradual, wavy boundary.

B1t—25 to 35 inches, olive-yellow (2.5Y 6/6) sandy loam; few, medium, faint, pale-olive (5Y 6/3) mottles and a few, medium, prominent, strong-brown (7.5YR 5/6) mottles; weak, very fine, subangular blocky

structure; friable; sand grains coated and bridged with clay; few small roots; very strongly acid; gradual, wavy boundary.

B2t—35 to 60 inches, pale-brown (10YR 6/3) sandy clay loam; many, medium, distinct, light-gray (2.5Y 7/2) mottles, common, medium, distinct, yellowish-brown (10YR 5/8) mottles, and few, medium, prominent, strong-brown (7.5YR 5/8) and yellowish-red (5YR 5/8) mottles; weak, fine, subangular blocky structure; friable; soft plinthite makes up about 8 percent of layer; very strongly acid.

The A1 horizon ranges from very dark gray to dark grayish brown. The A2 horizons range from light yellowish brown to pale yellow. The matrix of the B1t horizon is olive yellow to yellowish brown. Light-gray mottles occur at a depth of about 35 to 38 inches. The weighted average clay content of the upper part of the B horizon is typically about 25 percent, but the range is 18 to 35 percent. Soft plinthite, mostly yellowish red to strong brown, makes up more than 5 percent but less than 30 percent of the B2t horizon.

Stilson soils occur mainly with Pelham, Dothan, Fuquay, and Albany soils. They are not so well drained as Fuquay and Dothan soils. Stilson soils are not so poorly drained as Pelham soils. They are slightly better drained than Albany soils and have a thinner A horizon.

Stilson loamy sand (Se).—This soil occurs only in Bryan County. Slopes are mainly less than 2 percent. The seasonal high water table is 15 to 30 inches below the surface for about 2 months each year.

Included with this soil in mapping are small areas of Fuquay, Dothan, and Pelham soils. Also included are small areas of a soil similar to this Stilson soil except that it is somewhat poorly drained.

A small acreage is cultivated and pastured, and the rest is wooded. Most of the farming in Bryan County is on this soil (fig. 12). This soil has good tilth, and crops on it respond well to good management. It is suited to most locally grown crops. Excess water is a limitation to use for cultivated crops during extended wet periods, and some drainage practices are needed. Erosion is not a hazard. If fertilized, well drained, and otherwise well

Figure 12.—Peanuts and corn on Stilson loamy sand. Capability unit IIw–2.

managed, this soil is well suited to corn, tobacco, soybeans, and rye. Plants suitable for pasture and hay are Coastal bermudagrass, bahiagrass, oats, rye, crimson clover, and millet.

Row crops can be grown year after year if this soil is adequately drained, fertilized, and limed, and plant residue is returned to the soil. Drainage practices that are practical include installing open ditches, bedding, and tile drainage. Tile drainage is especially beneficial where tobacco is grown.

This soil is also suited to pine trees. Capability unit IIw–2; woodland group 3s2.

Tidal Marsh, Fresh

Tidal marsh, fresh (Tmh) is adjacent to the major fresh water streams. It occurs in the upper reaches of the marshland belt and is influenced by the daily tides. Except during storm tides, it also is influenced by the adjacent fresh water. Tidal marsh, fresh, is level or nearly level and from 3 to 5 feet above sea level.

This land type consists of sediments washed down by streams flowing out of the Coastal Plain and Piedmont Major Land Resource Areas. The soil material varies from place to place. The surface layer is black or dark grayish-brown silty clay loam that contains many roots. Underneath the surface layer is grayish-brown to black, soft, clayey material that has decaying logs, roots, and stumps intermixed. In some areas there are thin lenses of sand, and in other areas sandy material occurs at a depth of 3 to 8 feet.

Most of the acreage was used for growing rice before the turn of the century but is now idle. A small part is used for truck crops. If this marsh is kept dry for a long time, the surface subsides rapidly. The tilth of the surface layer is poor, and use of heavy machinery is difficult during wet periods.

The vegetation is chiefly giant cutgrass, maidencane, rushes, and cattails. Tidal marsh, fresh, is an excellent habitat for waterfowl and is used extensively by migratory wildlife. Capability unit VIIw–2; not assigned to a woodland group.

Tidal Marsh, Salty

Tidal marsh, salty (Tml) is between the barrier islands and the mainland. These areas daily are partly covered by normal high tides. The vegetation is salt-tolerant grass. This marsh is dissected by many tidal streams that vary in size and extend inland along the estuaries (fig. 13). The small creeks and streams generally connect the rivers and sounds. Some shifting of stream channels and relocation of materials are caused by strong tidal currents.

The sediments of this land type are very dark gray to black and loamy. Away from the streams, the surface layer is building up very slowly. The surface layer contains many pithy, fibrous roots, and the high organic-matter content gives it a bulk density of less than 1.0 in most areas. The material below the surface layer ranges from very dark gray to greenish gray and varies considerably in texture and consistence. Some areas are very unstable and do not support the weight of large animals. The reaction is alkaline, and the salt content is high. The sulfur content is more than 1 percent in most places, and a strong hydrogen sulfide odor is evident when the material is disturbed. Upon drying, the sulfur changes or oxidizes to sulfates, and an extremely low pH is the result.

Included with this land type in mapping are areas of Capers, Kershaw, and Osier soils.

None of this land is cultivated. The areas are marshes covered with smooth cordgrass. They are not managed but are important in furnishing food and spawning grounds for both wildlife and marine life. Capability unit VIIIw–3; not assigned to a woodland group.

Wahee Series

The Wahee series consists of somewhat poorly drained soils that have a highly mottled gray, red, and brown clayey layer below the surface layer. These soils occur on isolated, low ridges and have slopes of mostly less than 2 percent. They formed in sandy clay of the Coastal Plain marine terraces.

In a representative profile, the surface layer is very dark gray sandy loam about 5 inches thick. The subsurface layer is light yellowish-brown sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches. In sequence from the top, the upper 6 inches is brownish-yellow sandy clay loam mottled with shades of brown and gray, the next 21 inches is light brownish-gray clay mottled with red, and the lower 22 inches is gray clay and sandy clay loam mottled with shades of brown and red.

These soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. The available water capacity is medium, and permeability is slow.

The present vegetation is chiefly mixed loblolly pine, red oak, and sweetgum. Areas that have not been cleared normally have an understory of wiregrass and waxmyrtle. Most of the acreage is wooded, but about 20 percent is in pasture or cultivated crops.

Representative profile of Wahee sandy loam, 4.8 miles south of Richmond Hill and 2.2 miles east of U.S. Highway No. 17, west bank of Sheep Island Road, 800 feet south of Belfast Siding Road, Bryan County:

A1—0 to 5 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, granular structure; very friable; many small roots; very strongly acid; clear, smooth boundary.

A2—5 to 11 inches, light yellowish-brown (2.5Y 6/4) sandy loam; few, fine, faint, light brownish-gray (2.5Y 6/2) and light olive-brown (2.5Y 5/6) mottles; moderate, fine, granular structure; friable; few small roots; very strongly acid; clear, wavy boundary.

B1t—11 to 17 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, fine, faint, yellowish-brown (10YR 5/6) and light brownish-gray (10YR 6/2) mottles; weak, coarse, subangular blocky structure; firm; few small roots; very strongly acid; gradual, wavy boundary.

B21tg—17 to 38 inches, light brownish-gray (10YR 6/2) clay; common, fine and medium, prominent, red (10R 4/6) mottles; strong, medium, angular blocky structure that breaks to very fine, angular blocky structure; extremely firm; few small roots on some ped surfaces; prominent clay films on most ped surfaces; very strongly acid; gradual, wavy boundary.

Figure 13.—**Typical area of Tidal marsh, salty.**

B22tg 38 to 52 inches, gray (10YR 6/1) clay; common, fine and medium, prominent, light brownish-gray (2.5Y 6/2) mottles and common, fine and medium, prominent, red (2.5YR 4/6) mottles; moderate, coarse, angular blocky structure; very firm; distinct clay films on most ped surfaces; very strongly acid; gradual, wavy boundary.

B3g—52 to 60 inches, mottled gray (10YR 6/1), light yellowish-brown (10YR 6/4), strong-brown (7.5YR 5/8), and yellowish-red (5YR 5/8) sandy clay loam; weak, coarse, subangular blocky structure; firm; very strongly acid.

The A1 horizon ranges from very dark gray to dark grayish brown. The B1t horizon is light yellowish brown to olive. The B2tg horizons are reticulately mottled with shades of gray, red, and yellowish brown. In areas where the sand fraction is dominantly coarse sand, small rounded quartz fragments are common throughout the profile. The weighted average clay content of the upper 20 inches of the B horizon is typically about 38 percent and ranges from 35 to 45 percent.

The Wahee soils mapped in this survey area contain less than 30 percent silt, and therefore they are slightly outside of the range defined for the Wahee series. They are enough like the typical Wahee soils in morphology, composition, and behavior that a new series is not warranted.

Wahee soils occur mainly with the Ocilla, Craven, Pooler, and Ellabelle soils. They have a more clayey B horizon and a thinner A horizon than Ocilla soils. They are less well drained than Craven soils. They are less gray in the B horizon and are not so wet as the Pooler soils, though both are somewhat poorly drained. They are better drained than Ellabelle soils and lack the thick very dark gray to black surface layer.

Wahee sandy loam (Waf).—This soil has the profile described as representative for the series. Slopes are less than 2 percent.

Included with this soil in mapping are small areas of Craven, Pooler, and Ocilla soils. Also included are areas where the surface layer is loamy coarse sand.

The seasonal high water table is about 15 inches below the surface for a few days during wet periods.

A small acreage is used for pasture and cultivated crops; the rest is woodland or has been developed for

community use. These soils have fair tilth. They are fairly well suited to locally grown crops, such as corn, soybeans, rye, and oats, and such pasture and hay plants as Coastal bermudagrass, bahiagrass, or crimson clover.

Drainage practices are needed where cultivated crops are grown. These practices are installing open ditches, land leveling and shaping, or bedding. The clayey underlying layer is not effectively drained by a tile drainage system. The amounts of fertilizer and lime needed for plants should be determined by soil tests. Plant residue should be managed so as to leave it on the surface between the harvesting and planting. Erosion is not a hazard.

If management is good, corn or other suitable crops can be grown year after year.

These soils are also suited to trees (fig. 14). Capability unit IIIw–2; woodland group 2w8.

Wahee-Urban land complex (Wac).—This complex is 40 to 60 percent Wahee soils and 20 to 35 percent Urban land. The rest is Meggett and Cape Fear soils. The complex is somewhat poorly drained and occurs above the flats and drains. The composition of most mapped areas is in about the same proportion from place to place.

In undisturbed areas, the Wahee soils have a profile similar to the one described for the series. The seasonal high water table is about 15 inches below the surface for a few days during wet periods.

Urban land consists mainly of sites for houses, industrial buildings, parking lots, streets, and other structures that accompany community development. The landscape has been altered in places by cutting, filling, or grading and shaping. Identification of the soils in areas of Urban land is impractical because they are obscured by works and structures.

This complex is mapped only in the populated and industrial areas around Savannah and the adjoining towns and communities. Capability unit IIIw 2; not assigned to a woodland group.

Figure 14.—Stand of longleaf pine on Wahee sandy loam. Undergrowth has been controlled by burning.

Use and Management of the Soils

This section describes management and behavior of the soils of Bryan and Chatham Counties under specified conditions. These interpretations include the use of soils for town and country planning, for engineering, and for woodland. This section also describes management of the soils for cultivated crops and pasture and for wildlife. Additional interpretations can be made by studying the basic soil data and the soil requirements for the anticipated use.

Town and Country Planning

This part of the survey was prepared chiefly for planners, developers, landscape architects, builders, zoning officials, realtors, landowners, and others interested in use of the soils in Bryan and Chatham Counties for purposes other than farming. Chatham County has the largest population of any county in east Georgia, and its population is rapidly growing and expanding. This expansion has increased the demand for land for nonfarm uses, such as housing development, shopping centers, schools, parks, golf courses, and other community uses.

In selecting a site for a home, a highway, an industry, recreational use, or other nonfarm uses, the suitability of the soils in each site for such use must be determined. The behavior of soils for specific land uses can be predicted by using the same soil properties that are used by soil scientists as criteria for classifying soils. Among these properties are soil texture, reaction, shrink-swell potential, permeability, depth to the seasonal high water table, and hazard of flooding. On the basis of these and related characteristics, soil scientists and engineers have rated the soils of Bryan and Chatham Counties for specific nonfarm purposes. The ratings and the nature of the soil limitations that influenced the ratings are shown in table 2.

The ratings used are slight, moderate, and severe, and they apply to the soils as they occur naturally. A rating of *slight* means limitations are so minor that they can be easily overcome. Good performance and low maintenance can be expected, and limitations therefore are not listed for soils rated slight. A rating of *moderate* means soil properties are moderately favorable for the rated use. Limitations can be overcome or modified by planning, design, or special maintenance. A rating of *severe* means the soil has one or more properties unfavorable for the rated use. Limitations are difficult and costly to modify or overcome and require major soil reclamation, special design, or intensive maintenance.

In the paragraphs that follow, each soil use is defined and the important soil properties limiting the use are given. The information in table 2 can be used with information in other parts of the survey as a guide in planning the use of the soils for nonfarm purposes. Before beginning most construction projects, however, onsite investigation should be made.

Building sites for residences.—The ratings and limitations in table 2 are for sites for houses that are not more than three stories high. The soil properties most important in rating the soils are depth to seasonal high water table, flood hazard, shrink-swell potential, the ability to support loads, and slope. The kind of sewage disposal system is not one of the criteria considered in the rating.

Building sites for light industries.—These structures are used for stores, offices, and small industries. They are not more than three stories high. The soil properties important in rating the soils for this use are depth to seasonal high water table, the ability to support loads, flood hazard, shrink-swell potential, and slope. It is assumed that facilities for sewage disposal are available, and these are not considered in the rating.

Septic tank filter fields.—A septic tank filter field is a sewage sytem in which waste is distributed to a central tank, and the effluent from the tank is dispersed in a fairly large area through filter field lines buried in the soil (*12*). The soil properties most important in rating the soils for the proper operation of such a system are seasonal high water table, percolation rate, flood hazard, and slope.

Sewage lagoons.—A sewage lagoon consists of an impounded area and a dam. The chief requirements of a soil for use as a floor for the basin of a lagoon are (1) effective sealing against seepage, (2) an even, fairly level surface, and (3) little or no content of organic matter. The requirements for the dam are similar to those for other embankments built to hold impounded water. The soil properties that are important in determining the suitability of disturbed soils for constructing dams are stability, compaction characteristics, permeability of compacted soil, susceptibility to piping, shrink-swell potential, and content of organic matter. The soil properties important in rating the soils for the reservoir area are permeability, slope, organic-matter content, and the probability of damage by flooding. A sewage lagoon should generally be planned so that not less than 2 feet and not more than 5 feet of liquid is within the lagoon (*5*).

Sanitary land fills.—A sanitary land fill is an area used to dispose of household trash and garbage by compressing and burying it in the soil. The soil properties most important in constructing and operating such a fill are slopes, soil texture below the surface layer, depth to water table, and flood hazard.

Cemetery sites.—These are areas for underground burials. The chief requirement is a well-drained site that is free of flooding, that is easy to excavate to a depth of 5 feet, and that is well suited to plants commonly used in landscaping. The properties most important in rating soils for this use are slope, texture, depth to water table, flood hazard, and fertility.

Trafficways.—This term refers to low-cost roads and residential streets that require limited cut and fill and subgrade preparation. The properties most important in rating the soils for trafficways are slope, depth to water table, flood hazard, and traffic-supporting capacity.

Recreational facilities.—The recreational facilities considered in table 2 are picnic areas, playgrounds, camping areas, paths and trails, and golf fairways (*13*). The soil properties most important for such uses are wetness, the hazard of flooding, slopes, and texture of the surface layer. Permeability is also important for playgrounds and camping areas.

Picnic areas should be suitable for pleasure outings at which a meal is eaten outdoors. Such facilities as tables and fireplaces generally are furnished. It is assumed that most vehicular traffic is confined to access roads.

Playgrounds are areas used for organized games such as baseball, football, and badminton. They are subject to much foot traffic and generally require a level surface, good drainage, and a texture and consistence that give a firm surface.

Camping areas are used intensively for tents and small trailers and the accompanying activities of outdoor living. It is assumed that little site preparation will be done other than shaping and leveling for tent and parking areas and access routes. The soils should be suitable for heavy foot traffic and limited vehicular traffic.

Paths and trails refers to local and cross-country footpaths and trails and bridle paths. It is assumed that these areas will be used as they occur in nature and that little or no soil forming will be required.

Golf fairways in table 2 refers only to fairways because golf greens generally are made with borrow material.

Uses of the Soils in Engineering [2]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. Among the properties most important to engineers are permeability, strength, consolidation characteristics, texture, plasticity, and soil reaction. Depth to unconsolidated materials and topography are also important.

Information concerning these and related soil properties is given in tables 3, 4, and 5. The estimates and interpretations in these tables can be used to—

1. Make studies that will aid in selecting and developing industrial, commercial, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils in planning drainage systems, farm ponds, irrigation systems, terraces, waterways, and diversion terraces.
3. Make preliminary evaluations of soil conditions that will aid in selecting sites for highways, airports, pipelines, and cables, and in planning detailed investigations at selected locations.
4. Locate probable sources of gravel, sand, and other construction material.
5. Correlate performance of soil mapping units to develop information that will be useful in planning engineering practices and in designing and maintaining engineering structures.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement other publications, such as maps, reports, and aerial photographs, that are used in preparation of engineering reports for a specific area.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

The engineering interpretations reported here do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or excavations deeper than the depths reported (ordinarily about 5 feet). Even in these situations, however, the soil map is useful in planning more detailed field investigations and in indicating the kinds of problems that may be expected.

Some of the terms used by soil scientists have special meanings in soil science that may not be familiar to engineers. These terms are defined in the Glossary.

Engineering classification

The two systems most commonly used in classifying soils for engineering are the system approved by the American Association of State Highway Officials (AASHO) and the Unified system.

The AASHO system (*2*) is used to classify soils according to those properties that affect use in highway construction. In this system all soil material is classified in seven principal groups. The groups range from A–1, which consists of soils that have the highest bearing strength and are the best soils for subgrade, to A–7, which consists of soils that have the lowest strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number. The numbers range from 0, for the best material, to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol (see table 3).

In the Unified system (*11*) soils are classified according to their texture and plasticity and their performance as engineering construction material. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. GP and GW are clean gravels; GM is gravel that includes an appreciable amount of nonplastic fines; and GC is gravel that includes an appreciable amount of plastic fines. SP and SW are clean sands. SM and SC are sands that include fines of silt and clay. ML and CL are silts and clays that have a low liquid limit, and MH and CH are silts and clays that have a high liquid limit. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML–CL.

Soil scientists use the USDA textural classification (*9*). In this, the texture of the soil is determined according to the proportion of soil particles smaller than 2 millimeters in diameter, that is, the proportion of sand, silt, and clay. Textural modifiers, such as gravelly, stony, shaly, and cobbly, are used as needed.

Table 3 shows the AASHO and Unified classification of specified soils in the survey area, as determined by laboratory tests. Table 4 shows the estimated classification of all the soils in the survey area according to all three systems of classification.

[2] Prepared by WILLIAM H. PARK, agricultural engineer, Soil Conservation Service.

TABLE 2.—*Soil limitations*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in referring to other series that appear

Soil series and map symbols	Building sites—		Sewage disposal		Sanitary land fills
	Residences	Light industries	Septic tank filter fields	Sewage lagoons	
Albany: As	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate to severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
*Angelina: AB For Bibb part, see Bibb series.	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Bibb Mapped only with Angelina soils.	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Cape Fear: Cc	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Capers: Ch	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
*Chipley: Cm, Cuc For Urban land part of Cuc, see Urban land.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: rapid permeability.	Severe: seasonal high water table.
Coastal beach: Cub	Severe: flooding	Severe: flooding	Severe: flooding	Severe: very rapid permeability.	Severe: flooding
Craven: Cx	Moderate: seasonal high water table; moderate ability to support loads.	Moderate: moderate ability to support loads; seasonal high water table.	Severe: seasonal high water table; slow percolation.	Slight to moderate: moderate permeability below a depth of about 40 inches.	Severe: seasonal high water table.
Dothan: Da	Slight	Slight	Moderate to severe: moderate percolation.	Moderate: possible seepage.	Moderate: seasonal high water table.
Ellabelle: El	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Moderate: possible seepage; moderate permeability.	Severe: seasonal high water table; flooding.
Fresh water swamp: Fws	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Fuquay: Fs	Slight	Slight	Slight to moderate: slow percolation below depth of 50 inches.	Moderate: moderate permeability.	Slight
Johnson: Je	Severe: flooding	Severe: flooding	Severe: flooding	Severe: moderately rapid permeability.	Severe: flooding
*Kershaw: Kic, KkC For the Osier part of unit Kic, see the Osier series.	Moderate: soils need binder to improve stability.	Moderate: soils need binder to improve stability.	Severe: low filtering action; may contaminate shallow water supplies.	Severe: very rapid permeability.	Severe: sand texture; possible contamination of shallow water supplies.
Lakeland: Lp	Slight	Slight	Slight to severe: possible contamination of shallow water supplies.	Severe: rapid permeability.	Severe: sand texture.
Leon: Lr	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: moderately rapid permeability.	Severe: seasonal high water table.
Lucy: LMD	Slight to moderate: slope.	Moderate to severe: slope.	Slight to moderate: slope.	Severe: slope	Slight to moderate: slope.
Lynn Haven: LQ	Severe: flooding	Severe: flooding	Severe: flooding	Severe: moderately rapid or moderate permeability.	Severe: flooding

for town and country planning

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for in the first column of this table]

Cemetery sites	Trafficways	Recreational facilities				
		Picnic areas	Playgrounds	Camp areas	Paths and trails	Golf fairways
Severe: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: seasonal high water table.	Moderate: fair traffic-supporting capacity.	Moderate: fine sand surface layer.	Moderate: fine sand surface layer.	Moderate: fine sand surface layer.	Moderate: fine sand surface layer.	Moderate: fine sand surface layer.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: seasonal high water table.	Moderate: fair traffic-supporting capacity.	Slight	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Slight	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Slight	Slight	Moderate: moderately slow permeability.	Slight	Slight	Slight.
Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Slight to moderate: slightly droughty.	Slight	Slight to moderate: loamy sand surface layer.	Slight to moderate: slow permeability below depth 50 inches.	Slight to moderate: loamy sand surface layer.	Slight	Slight to moderate: loamy sand surface layer; slightly droughty.
Severe: flooding	Severe: flooding	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Severe: sand texture; droughty.	Moderate: fair traffic-supporting capacity; binder improves stability.	Severe: sand surface layer.	Severe: sand surface layer.	Severe: sand surface layer.	Severe: sand surface layer.	Severe: sand surface layer; droughty.
Severe: sand texture; droughty.	Slight	Moderate: sandy surface layer.	Moderate: sandy surface layer.	Moderate: sandy surface texture.	Moderate: sandy surface texture.	Moderate: sandy surface texture; droughty.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Moderate: slope; droughty.	Moderate: slope.	Moderate: sandy surface layer.	Severe: slope	Moderate: slope.	Moderate: sandy surface layer.	Moderate: slope; droughty.
Severe: flooding	Severe: flooding	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.

TABLE 2.—*Soil limitations for town*

Soil series and map symbols	Building sites—		Sewage disposal		Sanitary land fills
	Residences	Light industries	Septic tank filter fields	Sewage lagoons	
Made land: Mae	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: variable permeability.	Severe: seasonal high water table.
Mascotte: Mn	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Moderate: possible seepage; moderate permeability.	Severe: seasonal high water table.
Meggett: Mba	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; slow percolation.	Moderate: some areas subject to flood damage.	Severe: seasonal high water table.
*Ocilla: Oj, Ojc For Urban land part of Ojc, see Urban land.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate to severe: seasonal high water table; moderate percolation.	Moderate: moderate permeability.	Severe: seasonal high water table.
*Ogeechee: Ok, Okc For Urban land part of Okc, see Urban land.	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Moderate: seepage in some places; moderately slow permeability.	Severe: seasonal high water table; flooding.
Olustee: Ol	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: possible seepage; moderate permeability.	Severe: seasonal high water table.
Osier: Om	Severe: tidal flooding; seasonal high water table.	Severe: tidal flooding; seasonal high water table.	Severe: tidal flooding; seasonal high water table.	Severe: rapid permeability.	Severe: seasonal high water table; tidal flooding.
Pelham: Pl	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Moderate: moderate permeability.	Severe: seasonal high water table.
Pooler: Pn	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; slow percolation.	Slight	Severe: seasonal high water table.
Stilson: Se	Slight to moderate: seasonal high water table.	Slight to moderate: seasonal high water table.	Moderate to severe: seasonal high water table.	Moderate: moderate permeability.	Moderate: seasonal high water table.
Tidal marsh, fresh: Tmh	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Tidal marsh, salty: Tml	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Urban land: Properties of Urban land are too variable to rate. Urban land is mapped only with Chipley, Ocilla, Ogeechee, and Wahee soils.					
*Wahee: Waf, Wac For Urban land part of Wac, see Urban land.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: slow percolation.	Slight to moderate: moderate permeability below depth of about 50 inches.	Severe: seasonal high water table.

and country planning—Continued

Cemetery sites	Trafficways	Recreational facilities				
		Picnic areas	Playgrounds	Camp areas	Paths and trails	Golf fairways
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Severe: seasonal high water table.	Moderate: seasonal high water table.	Moderate to severe: seasonal high water table.	Moderate to severe: seasonal high water table.	Severe: seasonal high water table.	Moderate to severe: seasonal high water table.	Moderate to severe: seasonal high water table.
Severe: seasonal high water table; tidal flooding.	Severe: seasonal high water table; tidal flooding.	Severe: seasonal high water table; tidal flooding.	Severe: seasonal high water table; tidal flooding.	Severe: seasonal high water table; tidal flooding.	Severe: seasonal high water table; tidal flooding.	Severe: seasonal high water table; tidal flooding.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table; poor traffic-supporting capacity.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Slight	Slight to moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Slight	Moderate: seasonal high water table.
Severe: flooding	Severe: poor traffic-supporting capacity; flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: flooding	Severe: poor traffic-supporting capacity.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Severe: seasonal high water table.	Moderate: fair traffic-supporting capacity.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.

TABLE 3.—*Engineering*

[Tests *performed* by the State Highway Department of Georgia in cooperation with the Federal Highway Administration

Soil name and location	Parent material	Georgia report No.	Depth	Moisture density [1]		Volume change [2]		
				Maximum dry	Optimum	Shrinkage	Swelling	Total volume change
			Inches	*Lbs./cu. ft.*	*Percent*	*Percent*	*Percent*	*Percent*
Cape Fear soils:								
Chatham County: 0.3 mile S. of Augustine Creek Road, 2.6 miles W. of State Route 21, 5.6 miles N. of traffic circle (coarser textured in 0–10 inch layer than modal).	Acid marine sandy clay.	S64–Ga–25–11–1	0–10	89	25	4. 4	6. 9	11. 3
		S64–Ga–25–11–3	22–50	93	24	11. 5	13. 7	25. 2
		S64–Ga–25–11–4	50–72	98	20	13. 2	25. 8	39. 0
Chatham County: 100 feet W. of Bourne Ave., S. of Travis Field, 75 yards N. of Pipe Makers Canal (modal).	Acid marine clay.	S64–Ga–25–13–1	0–10	91	25	13. 5	5. 2	18. 7
		S64–Ga–25–13–2	10–38	86	29	22. 4	20. 0	42. 4
		S64–Ga–25–13–3	38–72	108	18	6. 1	40. 2	46. 3
Craven loamy fine sand:								
Bryan County: 9.6 miles S. of State Route 67, 4 miles E. of U.S. Highway No. 17 (modal).	Acid marine sandy clay.	S65–Ga–15–4–2	5–20	109	13	1. 2	0. 0	1. 2
		S65–Ga–15–4–4	26–46	97	17	7. 5	11. 7	19. 2
		S65–Ga–15–4–5	46–72	105	17	3. 5	10. 6	14. 1
Lakeland sand:								
Chatham County: Talahi Island 50 yards N. of U.S. Highway No. 80 and 50 feet E. of Quarterman Drive (modal).	Acid marine sand.	S64–Ga–2–5–2	8–42	102	14	0. 0	1. 6	1. 6
Ocilla loamy fine sand:								
Bryan County: 0.4 mile NW. of Warren Hill Road on Deep Creek Road, 0.9 mile N. of Belfast Siding Road, 4.6 miles S. of Richmond Hill (modal).	Acid marine sand and clay.	S65–Ga–15–3–2	6–24	107	13	0. 0	8. 6	8. 6
		S65–Ga–15–3–4	31–55	103	17	6. 4	9. 4	15. 8
		S65–Ga–15–3–5	55–72	106	17	2. 9	7. 5	10. 4
Ogeechee loamy fine sand:								
Chatham County: 10 feet N. of Adam Road, 1.4 miles N. and E. of Bloomingdale (modal).	Acid marine sandy clay.	S65–Ga–25–8–1	0–6	111	15	1. 3	6. 9	8. 2
		S65–Ga–25–8–5	24–63	97	18	6. 0	13. 1	19.1
		S65–Ga–25–8–6	63–72	109	16	7. 9	13. 0	20. 9
Chatham County: 2.6 miles NE. of Morgan's Bridge on C.C. Road, 10 feet S. of C.C. Road (finer textured surface layer than modal).	Acid marine sandy clay.	S65–Ga–25–9–1	0–7	106	14	2. 3	9. 1	11. 4
		S65–Ga–25–9–3	12–44	106	18	6. 3	9. 8	16. 1
Pooler fine sandy loam:								
Chatham County: 20 feet N. of Godley Road, 3.4 miles W. of State Route 21, 5.6 miles N. of traffic circle (modal).	Acid marine clay.	S65–Ga–25–10–2	5–13	126	10	0. 5	1. 1	1. 6
		S65–Ga–25–10–3	13–42	99	16	7. 5	20. 9	28. 4
		S65–Ga–25–10–4	42–72	114	11	2. 0	12. 4	14. 4

See footnotes at end of table.

test data

(FHWA), in accordance with standard procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis [3]								Liquid limit	Plasticity index	Classification	
Percentage passing sieve—				Percentage smaller than -							
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO	Unified [4]
								Percent			
100	99	73	38	31	26	12	8	33	[5] NP	A-4(1)	SM
100	99	86	64	63	62	54	50	35	16	A-6(8)	CL
100	99	89	51	50	48	42	36	33	17	A-6(6)	CL
----------	100	96	64	62	53	43	35	28	7	A-4(6)	ML-CL
----------	100	99	74	72	70	56	50	40	19	A-6(12)	CL
----------	100	98	54	53	51	42	36	35	20	A-6(8)	CL
----------	100	99	33	24	20	8	7	----------	NP	A-2-4(0)	SM
----------	100	100	59	55	49	43	42	40	23	A-6(10)	CL
100	99	99	39	33	31	30	29	29	13	A-6(2)	SC
----------	100	100	8	8	8	6	5	----------	NP	A-3	SM-SP
100	99	97	34	24	13	6	5	----------	NP	A-2-4(0)	SM
----------	100	99	51	47	41	36	35	34	18	A-6(6)	CL
----------	100	93	31	28	28	26	26	27	10	A-2-4	SC
100	96	50	18	19	18	7	4	----------	NP	A-2-4(0)	SM-SP
100	97	67	47	47	46	39	37	46	28	A-7-6(9)	SC
100	93	56	31	30	30	28	27	37	24	A-2-6(3)	SC
100	99	70	26	25	18	10	7	----------	NP	A-1-6	SM
100	100	82	44	42	39	34	32	34	20	A-6(5)	SC
100	97	51	21	20	18	11	8	----------	NP	A-2-4(0)	SM
100	99	75	55	55	54	46	44	53	38	A-7-6(13)	CH
[6] 99	89	46	26	26	25	23	23	42	30	A-2-7(2)	SC

TABLE 3.—*Engineering*

Soil name and location	Parent material	Georgia report no.	Depth	Moisture density [1]		Volume change [2]		
				Maximum dry	Optimum	Shrinkage	Swelling	Total volume change
			Inches	*Lbs./cu. ft.*	*Percent*	*Percent*	*Percent*	*Percent*
Stilson loamy sand:								
Bryan County: 50 yards SW. of cross roads, 0.8 mile S. of U.S. Highway No. 280, 5.4 miles W. of Pembroke (coarser textured than modal in the 38–72 inch layer).	Coastal Plain sands and clays.	S65–Ga–15–5–2	6–21	114	10	0. 7	5. 6	6. 3
		S65–Ga–15–5–4	26–38	118	10	2. 0	4. 9	6. 9
		S65–Ga–15–5–5	38–72	116	13	1. 9	6. 3	8. 2
Bryan County: 1.4 miles E. of Lanier and 30 feet N. of Ga. Highway 204 (modal).	Coastal Plain sands and clays.	S65–Ga–25–6–2	8–22	111	10	0. 7	8. 5	9. 2
		S65 -Ga 25 6 -4	27–38	107	16	4. 0	5. 2	9. 2
		S65–Ga -25–6 5	38 72	107	19	4. 2	7. 2	11. 4
Bryan County: 2.3 miles W. of Blitchton, 0.5 mile N. of U.S. Highway 80 in pasture, 1 mile NW. of paved county road (finer textured than modal in the 38–72 inch layer).	Coastal Plain sands and clays.	S65–Ga–25–7–2	7–20	115	10	1. 1	5. 0	6. 1
		S65–Ga–25–7–4	25–38	112	14	3. 5	2. 2	5. 7
		S65–Ga 15–7–5	38 72	98	20	8. 1	7. 6	15. 7

[1] Based on AASHO Designation: T 99–57 (*2*)

[2] Based on "A System of Soil Classification" by W. F. Abercrombie (*1*).

[3] Mechanical analysis according to AASHO Designation T 88. Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeter

test data—Continued

Mechanical analysis [3]								Liquid limit	Plasticity index	Classification	
Percentage passing sieve—				Percentage smaller than—							
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO	Unified [4]
[6] 99	98	92	24	16	12	7	6	----------	NP	A–2–4(0)	SM
[6] 98	96	93	32	24	20	15	14	----------	NP	A–2–4(0)	SM
--------	100	97	36	31	26	22	20	22	NP	A–4(0)	SM
100	99	76	19	16	14	8	6	----------	NP	A–2–4(0)	SM
[6] 97	97	94	35	33	31	25	23	26	9	A–2–4(0)	SC
----------	100	99	42	41	39	32	30	35	15	A–6(3)	SC
----------	100	92	24	18	15	8	6	----------	NP	A–2–4(0)	SM
----------	100	94	41	40	37	31	29	29	13	A–6(2)	SC
----------	100	95	52	51	48	42	41	43	25	A–7–6(9)	CL

in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

[4] SCS and FHWA have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification. Examples are SM–SP and ML–CL.

[5] Nonplastic.

[6] 100 percent passes ⅜-inch sieve.

TABLE 4.—*Estimated engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in referring to other series that appear in the first column of

Soil series and map symbol	Depth to seasonal high water table	Depth from surface	Classification	
			Dominant USDA texture	Unified
	Inches	*Inches*		
Albany: As	15–24	0–42	Fine sand	SM
		42–68	Sandy clay loam	SC
*Angelina: AB	(1)	0–3	Loam	ML
		3–14	Sand	SM
		14–50	Loam and silty clay loam	ML or CL
For Bibb part, see *Bibb* series.				
Bibb	(1)	0–46	Sandy loam to sand	SM
Mapped only with Angelina soils.				
Cape Fear: Cc	(1)	0–10	Clay loam	SM or ML–CL
		10–38	Clay	CL or CH
		38–72	Sandy clay	CL
Capers: Cn	(1)	0–19	Clay loam	CL or CH
		19–60	Clay	CH
*Chipley: Cm, Cuc	15–36	0–65	Fine sand	SM or SP–SM
For Urban land part of Cuc see Urban land.				
Coastal beach: Cub	(2)	0–72	Fine sand	SP
Craven: Cx	20–24	0–12	Loamy fine sand and sandy loam	SM
		12–40	Sandy clay	SC or CL
		40–75	Sandy clay loam and sandy loam	SC
Dothan: Da	36–45	0–16	Loamy sand	SM
		16–42	Sandy clay loam	SC
		42–60	Sandy clay loam	SC
Ellabelle: El	(1)	0–22	Loamy sand	SM
		22–60	Sandy clay loam	SC
Fresh water swamp: Fws. Properties too variable to estimate. Water table at or near the surface.				
Fuquay: Fs	>45	0–30	Loamy sand and sandy loam	SM
		30–50	Sandy clay loam	SC
		50–80	Sandy clay loam	SC
Johnston: Je	(1)	0–60	Loam to fine sandy loam	SM
*Kershaw: KkC, Kic	>60	0–72	Coarse sand	SP
For Osier part of Kic, see Osier series.				
Lakeland: Lp	>60	0–72	Sand	SP–SM
Leon: Lr	6–15	0–12	Fine sand	SP–SM
		12–19	Fine sand	SP–SM
		19–60	Fine sand	SP–SM
Lucy: LMD	>60	0–22	Loamy sand and sand	SM
		22–72	Sandy clay loam	SC
Lynn Haven: LQ	(1)	0–60	Sand	SM

See footnotes at end of table.

properties of the soils

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for table. The sign < means less than; > means more than]

Classification—Con.	Percentage passing sieve—				Permeability	Percolation	Available water capacity	Reaction	Shrink-swell potential
AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
					Inches per hour	*Minutes per inch*	*Inch per inch of soil*	*pH*	
A–2	100	95–100	90–100	12–15	2. 0 6. 3	<45	0. 04–0. 06	4. 5–5. 0	Low.
A–6 or A–4	100	100	95–100	36–40	0. 63–2. 0	45–75	0. 08–0. 12	4. 5–5. 0	Low.
A–4	100	100	95–100	50–60	0. 63–2. 0	45–75	0. 12–0. 18	4. 5–5. 0	Low.
A–2	100	100	95–100	12–15	2. 0–6. 3	<45	0. 02–0. 04	4. 5–5. 0	Low.
A–4 or A–6	100	100	95–100	50–80	0. 06–0. 20	45–75	0. 13–0. 15	4. 5–5. 0	Low to moderate.
A–2	100	95–100	75–95	15–25	0. 63–0. 20	<45	0. 04–0. 12	4. 5–5. 0	Low.
A–4 or A 6	100	95–100	70–100	36–55	0. 63–2. 0	45–75	0. 12–0. 14	4. 5–5. 0	Low.
A–6 or A 7	100	95–100	85–100	60 75	0. 06–0. 20	>75	0. 08–0. 12	4. 5–5. 0	Moderate to high.
A–6	100	95–100	85–100	50–60	0. 2–0. 63	>75	0. 10–0. 14	4. 5–5. 0	Moderate to high.
A–6 or A 7	100	100	75–95	55 70	0. 2–0. 63	>75	0. 14–0. 18	4. 0–7. 3	Moderate.
A–7	100	100	85–100	60 90	0. 06–0. 2	>75	0. 15–0. 17	4. 0–7. 3	High.
A–2	100	100	95–100	5–15	6. 3–10. 0	<45	0. 05–0. 07	4. 5–5. 5	Low.
A–3	100	100	100	<5	>20. 0	<45	0. 01–0. 03	7. 5–8. 5	Low.
A–2	100	100	90–100	15–35	2. 0–6. 3	<45	0. 05–0. 08	4. 5–5. 5	Low.
A–6	100	100	95–100	40–60	0. 06–0. 20	45–75	0. 12–0. 14	4. 5–5. 5	Low to moderate.
A–6	100	95–100	90–100	36–45	0. 63–2. 0	45 75	0. 10–0. 12	4. 5–5. 5	Low.
A–2	95–100	95–100	75–95	15 25	2. 0–6. 3	<45	0. 06–0. 08	4. 5–5. 5	Low.
A–6 or A–4	95–100	95–100	85–95	36–45	0. 63–2. 0	45–75	0. 12–0. 14	4. 5–5. 5	Low.
A–6	100	100	90–100	36–50	0. 2–0. 63	45–75	0. 10–0. 12	4. 5 5. 5	Low.
A–2	100	100	75–98	20–30	2. 0 6. 3	<45	0. 05–0. 08	4. 5–5. 0	Low.
A–6	100	100	80–95	36 45	0. 63–2. 0	45–75	0. 10–0. 14	4. 5–5. 0	Low to moderate.
A–2	95–100	95–100	75–95	15–25	6. 3–10. 0	<45	0. 04–0. 08	4. 5–5. 0	Low.
A–6	95–100	95–100	85–95	36–45	0. 63–2. 0	45 75	0. 10–0. 14	4. 5–5. 0	Low.
A–6	95–100	95–100	80–90	40–50	0. 06–0. 20	>75	0. 40–0. 14	4. 5–5. 0	Low.
A–6	100	100	80–95	36–45	2. 0 6. 3	45 75	0. 08–0. 12	4. 5–5. 0	Low.
A–3	100	95–100	51–60	4–5	>20. 0	<45	0. 01–0. 04	4. 5–5. 0	Low.
A–3	100	100	70–100	5 10	6. 3–15. 0	<45	0. 03–0. 05	4. 0–5. 5	Low.
A–3	100	100	90–100	2–10	2. 0–6. 3	<45	0. 04–0. 06	4. 0–5. 5	Low.
A–2	100	100	90–100	5–12	2. 0–6. 3	<45	0. 06–0. 08	4. 0–5. 5	Low.
A–2	100	100	90–100	5–12	2. 0–6. 3	<45	0. 04–0. 06	4. 0–5. 5	Low.
A–2	100	95–100	85–95	15–25	2. 0–6. 3	<45	0. 06–0. 09	4. 5–5. 5	Low.
A–6	100	95–100	85–95	36–45	0. 63–2. 0	45–75	0. 10–0. 14	4. 5–5. 5	Low.
A–2	100	100	90–95	12–15	0. 63–6. 3	<45	0. 04–0. 06	4. 0–5. 5	Low.

TABLE 4.—*Estimated engineering*

Soil series and map symbol	Depth to seasonal high water table	Depth from surface	Classification	
			Dominant USDA texture	Unified
	Inches	*Inches*		
Made land: Mae	(1)			
Mascotte: Mn	15–30	0–18	Sand	SP–SM
		18–22	Sand	SM
		22–38	Sand	SP–SM
		38–60	Sandy clay loam and sandy loam	SC
Meggett: Mba	0–12	0–12	Loam and fine sandy loam	ML or SM
		12–46	Clay and sandy clay	CL or CH
		46–60	Sandy clay	CL
*Ocilla: Oj, Ojc For Urban land part of Ojc, see Urban land.	15–30	0–22	Loamy fine sand	SM
		22–46	Sandy clay loam	SC or CL
		46–60	Sandy clay loam	SC
*Ogeechee: Ok, Okc For Urban land part of Okc, see Urban land.	(1)	0–8	Loamy fine sand	SM or SP–SM
		8–23	Sandy clay loam	SC
		23–42	Sandy clay and sandy clay loam	SC or CL
		42–60	Sandy clay loam	SC
Olustee: Ol	15–30	0–32	Fine sand	SM
		32–60	Sandy clay loam	SC
Osier: Om	0–15	0–60	Fine sand	SP–SM or SM
Pelham: Pl	0–6	0–24	Loamy sand	SM
		24–60	Sandy clay loam and sandy loam	SC
Pooler: Pn	0–12	0–5	Fine sandy loam	SM
		5–46	Clay	CL or CH
		46–60	Sandy clay and sandy clay loam	CL or SC
Stilson: Se	15–30	0–25	Loamy sand	SM
		25–35	Sandy loam	SC
		35–60	Sandy clay loam	SC
Tidal marsh, fresh: Tmh. Properties are too variable to estimate. Water table at or near the surface.				
Tidal marsh, salty: Tml. Properties are too variable to estimate. Water table at or near the surface.				
Urban land: Properties of Urban land are too variable to estimate. Mapped only with Chipley, Ocilla, Ogeechee, and Wahee soils.				
*Wahee: Waf, Wac For Urban land part of Wac, see Urban land.	15–18	0–11	Sandy loam	SM
		11–52	Sandy clay and clay	CL
		52–60	Sandy clay loam	SC

[1] At or near the surface.
[2] At or above the surface.

properties of the soils—Continued

Classification—Con.	Percentage passing sieve—				Permeability	Percolation	Available water capacity	Reaction	Shrink-swell potential
AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
					Inches per hour	*Minutes per inch*	*Inch per inch of soil*	*pH*	
A–3	100	95–100	51–95	5–10	2. 0–6. 3	<45	0. 04–0. 06	4. 5–5. 5	Low.
A–2	100	95–100	65–85	5–15	0. 63–2. 0	<45	0. 06 0. 08	4. 5 5. 5	Low.
A–3	100	95–100	65–80	5–10	2. 0–6. 3	<45	0. 04–0. 06	4. 5–5. 5	Low.
A–6	100	95–100	55–85	36–45	0. 63–2. 0	45–75	0. 12–0. 14	4. 5–5. 5	Moderate.
A–4	100	100	75–95	45–55	0. 63–2. 0	45 75	0. 10–0. 14	5. 6–6. 5	Low.
A–6 or A–7	95–100	95–100	85–100	60–75	0. 06–0. 2	>75	0. 10–0. 12	6. 5–7. 8	Moderate to high.
A–6	100	100	85–95	50–60	0. 2–0. 63	>75	0. 10–0. 14	6. 0–7. 8	Moderate.
A–2	100	95–100	85–100	25–35	6. 3–2. 0	<45	0. 06–0. 08	4. 5–5. 0	Low.
A–6	100	95–100	90–100	40–55	0. 63 2. 0	>75	0. 10–0. 13	4. 5–5. 0	Low.
A–6 or A–2	100	95–100	70–95	30–50	0. 63 2. 0	45–75	0. 10–0. 12	4. 5–5. 0	Low.
A–2 or A–1	100	95–100	45–85	12 30	2. 0–6. 3	<45	0. 03–0. 05	4. 5–5. 5	Low.
A 6	100	95–100	55–85	36–45	0. 63–2. 0	45–75	0. 11–0. 13	4. 5–5. 5	Low.
A–6 or A–7	100	95–100	65 85	40–55	0. 2–0. 63	>75	0. 12–0. 14	4. 5–5. 5	Low.
A–6	100	95–100	55–85	36–45	0. 63–2. 0	45–75	0. 10–0. 12	4. 5–5. 5	Low.
A–2	100	95–100	85 98	12–15	6. 30–10. 0	<45	0. 04–0. 06	4. 5–5. 5	Low.
A–6	100	95–100	75–98	36–40	0. 63 2. 0	45–75	0. 12–0. 14	4. 5–5. 5	Low.
A–3 or A–2	100	100	45–80	5–15	6. 3–10. 0	<45	0. 03–0. 05	5. 1–8. 5	Low.
A–2	100	95–100	85–98	12–20	2. 0–6. 3	<45	0. 06–0. 08	4. 5 5. 0	Low.
A–6	100	95–100	90–90	36–45	0. 63–2. 0	45–75	0. 10–0. 14	4. 5–5. 0	Low.
A–2	100	95–100	50–75	20–35	0. 63–2. 0	45–75	0. 08–0. 10	4. 5–5. 5	Low.
A–6 or A–7	100	95–100	70–85	50–75	0. 06–0. 20	>75	0. 12–0. 14	4. 5–5. 5	Moderate to high.
A–6 or A 2	95–100	85–100	75–95	25–60	0. 2–0. 63	>75	0. 10–0. 14	4. 5–5. 5	Low.
A–2	95–100	95–100	75–95	15 25	2. 0 6. 3	<45	0. 05–0. 08	4. 5–5. 5	Low.
A–2 or A–6	95–100	95–100	90–95	30–45	0. 63–2. 0	45–75	0. 10–0. 12	4. 5–5. 5	Low.
A–6 or A–4	100	95–100	90–100	36–45	0. 63–2. 0	45–75	0. 10–0. 14	4. 5–5. 5	Low.
A–2	100	95–100	50–95	15–30	2. 0–6. 3	<45	0. 08–0. 11	4. 5–5. 0	Low.
A–6, A–7	100	95–100	65–85	50 60	0. 06–0. 20	>75	0. 12–0. 14	4. 5–5. 0	Moderate
A–6	100	95–100	55–85	40–50	0. 63–2. 0	45–75	0. 10–0. 12	4. 5–5. 0	Low.

TABLE 5.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in the series is made up of two or more kinds of soil. The soils in referring to other series that appear

Soil series and map symbols	Suitability as source of—		Soil features affecting—
	Topsoil	Road fill	Highway location
Albany: As	Fair: medium to low natural fertility.	Good	Seasonal high water table.
*Angelina: AB For Bibb part, see Bibb series.	Fair: seasonal high water table.	Fair: seasonal high water table; flooding.	Seasonal high water table; flooding.
Bibb Mapped only with Angelina soils.	Fair: seasonal high water table; flooding.	Poor: seasonal high water table; flooding.	Seasonal high water table; flooding.
Cape Fear: Cc	Poor: plastic material	Poor: plastic material; poor compaction properties.	Plastic material; flooding.
Capers: Ch	Poor: plastic material	Poor: plastic material	Unstable material; flooding.
*Chipley: Cm, Cuc For Urban land part of Cuc, see Urban land.	Fair: medium to low fertility.	Good	Seasonal high water table.
Coastal beach: Cub	Poor: coarse texture; saline.	Fair: needs binder	Subject to tidal flooding
Craven: Cx	Fair: slightly plastic underlying material.	Fair: slightly plastic underlying material.	Slightly plastic underlying material; seasonal high water table.
Dothan: Da	Good	Good	Features generally favorable.
Ellabelle: El	Fair: wetness	Poor: high organic matter content in surface layer.	Seasonal high water table; flooding.
Fresh water swamp: Fws	Poor: wetness; poor accessibility.	Poor: poor stability; wetness.	Flooding; low stability
Fuquay: Fs	Good to fair	Good	Features generally favorable.
Johnston: Je	Poor: moderate	Poor: moderate organic-matter content.	Moderate organic-matter content; flooding.
*Kershaw: KkC, KkC For Osier part of Kkc, refer to the Osier series.	Poor: droughty	Fair: needs binder	Loose sand hinders hauling operations.
Lakeland: Lp	Poor: low natural productivity.	Good	Fair stability and strength
Leon: Lr	Poor: low available water capacity; low fertility.	Good	Seasonal high water table
Lucy: LMD	Good	Good to fair	Features generally favorable.

interpretations

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for in the first column of this table]

Soil features affecting—Continued				
Dikes and levees	Farm ponds		Drainage	Irrigation
	Reservoir area	Embankment		
Fair stability; moderate permeability below depth of about 4 feet.	Moderately rapid permeability in uppermost 4 feet of soil.	Sandy material in uppermost 4 feet of soil; fair stability and compaction properties below depth of 4 feet.	Moderate permeability below depth of 4 feet; needs surface drainage.	Low available water capacity.
Fair stability	Features generally favorable.	Fair stability; fair compaction characteristics.	Flooding; seasonal high water table; slow permeability.	Flooding; wet for long periods.
Fair stability	Organic matter in pockets; moderate permeability.	Fair stability; moderate to low strength.	Flooding; seasonal high water table.	Flooding; wet for long periods.
Moderate to high shrink-swell potential; moderate strength and fair stability.	Features generally favorable.	Fair stability; medium to high compressibility; moderate to high shrink-swell potential.	Flooding; slow permeability; subsurface drainage not effective.	Moderate intake rate; medium available water capacity.
Poor stability; high shrink-swell potential; slow permeability.	High organic-matter content in surface layer.	Poor stability; low strength; high shrink-swell potential.	Slow permeability; subsurface drainage not effective; outlets difficult to locate.	Slow permeability; wet for long periods.
Fair stability on steep slopes.	Rapid permeability; seepage likely.	Fair stability	Rapid permeability; seasonal high water table; side slopes of ditches subject to sloughing.	Rapid intake rate; low available water capacity.
Poor stability on steep slopes.	Rapid permeability	Poor stability; rapid permeability.	Subject to tidal flooding	Subject to tidal flooding; saline.
Fair to good stability	Features generally favorable.	Fair to good stability and compaction properties; medium compressibility.	Slow permeability; seasonal high water table.	Medium available water capacity.
Features generally favorable.	Features generally favorable.	Features generally favorable.	Well drained	Features generally favorable.
Surface layer high in organic-matter content.	Moderate permeability	Fair stability; permeability moderately slow after compaction.	Flooding; seasonal high water table; outlets difficult to locate.	Flooding; seasonal high water table; medium available water capacity.
Poor stability; high organic-matter content.	Permeability variable; organic deposits.	Poor stability; high compressibility.	Seasonal high water table; flooding.	Texture, permeability, and intake rate variable.
Fair stability	Slow permeability in the lower part.	Fair stability	Well drained	Low available water capacity.
Moderate organic-matter content; seepage likely.	Moderately rapid permeability.	Poor stability and strength.	Flooding; high seasonal water table.	Wet for long periods; moderately rapid permeability.
Very rapid permeability; fair stability; subject to gullying on steep slopes.	Very rapid permeability; excessive seepage.	Sandy material; excessive seepage.	Excessively drained	Very low available water capacity.
Rapid permeability; fair stability.	Rapid permeability; excessive seepage.	Sandy material; excessive seepage.	Excessively drained	Rapid intake rate; very low available water capacity.
Fair stability on flat side slopes; seepage likely.	Moderately rapid permeability; excessive seepage.	Sandy material; excessive seepage likely.	Moderately rapid permeability; seasonal high water table.	Moderately rapid intake rate; low available water capacity.
Fair to good stability; moderate permeability.	Moderate permeability; moderate to low seepage.	Features generally favorable.	Well drained	Moderately rapid intake rate; low available water capacity.

TABLE 5.—*Engineering*

Soil series and map symbols	Suitability as source of—		Soil features affecting—
	Topsoil	Road fill	Highway location
Lynn Haven: LQ	Fair: wetness	Poor: seasonal high water table.	Seasonal high water table; flooding.
Made land: Mae. Properties are too variable to rate.			
Mascotte: Mn	Fair: low fertility	Good in surface layer; fair below.	Seasonal high water table.
Meggett: Mba	Poor: plastic material	Poor: plastic material	Seasonal high water table; plastic material.
*Ocilla Oj, Ojc For Urban land part of Ojc, refer to Urban land.	Good	Good	Seasonal high water table.
*Ogeechee: Ok, Okc For Urban land part of Okc, refer to Urban land.	Fair: wetness	Fair in surface layer; poor below.	Seasonal high water table.
Olustee: Ol	Good	Good in uppermost 2 feet of soil; fair below.	Seasonal high water table.
Osier: Om	Fair: wetness	Fair: needs binder	Seasonal high water table.
Pelham: Pl	Fair: wetness	Poor: wetness	Seasonal high water table.
Pooler: Pn	Poor: plastic material	Poor: plastic material	Plastic material; seasonal high water table.
Stilson: Se	Good	Good	Seasonal high water table
Tidal marsh, fresh: Tmh. Properties are too variable to rate.			
Tidal marsh, salty: Tml. Properties are too variable to rate.			
Urban land: Properties are too variable to rate. Mapped only with Chipley, Ocilla, Ogeechee, and Wahee soils.			
*Wahee: Wac, Waf For Urban land part of Wac refer to Urban land.	Fair: clayey underlying material.	Fair: clayey, plastic underlying material.	Seasonal high water table; plastic underlying material.

interpretations—Continued

Soil features affecting—Continued				
Dikes and levees	Farm ponds		Drainage	Irrigation
	Reservoir area	Embankment		
Fair stability on gentle slopes.	Moderately rapid to moderate permeability.	Poor to fair stability; permeability rapid to moderate after construction.	Subject to flooding; rapid permeability; outlets difficult to locate.	Wet for long periods; rapid intake rate; low available water capacity.
Fair stability	Moderate permeability	Sandy material in uppermost 3 feet of soil; fair stability.	Moderate permeability; seasonal high water table.	Rapid intake rate; low available water capacity.
Moderate to high shrink-swell potential; fair stability.	Features generally favorable.	High compressibility; fair to poor compaction properties.	Slow permeability; seasonal high water table; outlets difficult to locate.	Moderate intake rate; slow permeability.
Fair stability	Moderate permeability	Fair stability; medium compressibility.	Seasonal high water table; needs surface drainage.	Moderately rapid intake rate; low to medium available water capacity.
Fair stability	Features generally favorable.	Fair stability; medium compressibility.	Seasonal high water table; moderately slow permeability; outlets difficult to locate.	Moderately slow permeability.
Fair stability	Moderate permeability; moderate seepage.	Fair stability; fair to good compaction properties.	Seasonal high water table; moderate permeability.	Moderately rapid intake rate; low available water capacity.
Fair stability on gentle slopes.	Rapid permeability; excessive seepage.	Sandy material; excessive seepage.	Flooding; seasonal high water table; outlets difficult to locate.	Very low available water capacity; wet for long periods.
Fair stability	Moderate permeability	Fair stability	Seasonal high water table; needs surface and subsurface drainage.	Moderately rapid intake rate; medium available water capacity.
Moderate to high shrink-swell potential; slow permeability.	Features generally favorable.	Fair stability; medium to high compressibility.	Slow permeability; seasonal high water table.	Moderate intake rate; wet for long periods.
Fair stability	Moderate permeability; moderate seepage.	Fair stability; fair to good compaction properties.	Moderate permeability; surface drainage needed.	Moderately rapid intake rate; low to medium available water capacity.
Fair stability; moderate shrink-swell potential.	Features generally favorable.	Fair stability; medium to high compressibility.	Slow permeability; seasonal high water table.	Moderately rapid intake rate; medium available water capacity.

Engineering test data

To help evaluate the soils in Bryan and Chatham Counties for engineering purposes, samples of Cape Fear, Craven, Lakeland, Ocilla, Ogeechee, Pooler, and Stilson soils were tested according to standard procedures. The results are given in table 3.

Moisture-density data are obtained by compacting soil material several times at successively higher moisture content. Assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in the compaction test is called the maximum dry density. Moisture-density data are important in earthwork because, as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

To obtain the percentages of shrinkage and swelling, compacted samples were prepared at optimum moisture content and then subjected to drying and wetting. The sum of these two values is the total volume change.

The relative proportions of the different size particles in the soil samples were determined through mechanical analysis made by a combination of the sieve and hydrometer methods.

The test that determines the plastic limit and liquid limit measures the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from a semisolid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between liquid limit and plastic limit. It indicates the range of moisture content within which a soil is in a plastic condition.

Estimated properties of the soils

Estimates of the soil properties significant in engineering are shown in table 4. These estimates are based on field observations, test data, and past experience in engineering. The estimates are for the modal profile to a depth of about 5 feet; some variation in characteristics must be expected for soils within a mapping unit. In addition, mapped areas may contain other included soils. Depth to bedrock for most of the soils in the survey area is well below depths to which soils were investigated during field mapping.

Permeability in inches per hour refers to the rate at which water moves through the soil. The estimates of permeability are based on the structure, texture, porosity, and consistence of the soils and on field observations.

Available water capacity is the capacity of a soil to hold water in a form available to plants. It is measured as the difference between the amount of water available in a soil at field capacity and the amount in the soil at the permanent wilting point. This capacity is determined mainly by the texture, structure, density, and organic-matter content of the soil. Fine-grained soils have a greater water-holding capacity than coarse-grained soils.

Reaction refers to the degree of acidity or alkalinity of a soil.

Shrink-swell potential is an indication of the volume change to be expected with a change in moisture content. It is estimated primarily on the basis of the amount and type of clay in the soil. In general, soils classified as CH and A–7 are moderate or high in shrink-swell potential; sands and soils that have small amounts of nonplastic or slightly plastic fines are low; and silty clays and sandy clays that are nonplastic or slightly plastic are moderate.

Engineering interpretations

The suitability of the soils for specific uses and the soil features that significantly affect highway construction or other engineering uses are shown in table 5. The features that affect a given use must be determined by onsite inspection.

Topsoil is productive soil or soil material, ordinarily rich in organic matter, that is used as a topdressing for lawns, gardens, roadbanks, and the like. The ratings indicate suitability for such use.

In rating soils as a source of material for road fill, the features generally considered are plasticity, water content, compaction characteristics, and erodibility. Neither highly plastic clay nor loose sand that does not have high strength when compacted is suitable for road fill.

Highway location is affected by a seasonal high water table, flooding, seepage, plasticity, erodibility, and stability. A seasonal high water table and flooding are the most common adverse soil features for highway location in Bryan and Chatham Counties.

Dikes and levees are relatively low in height and are susceptible to few hazards. The main features that affect suitability for this use are stability, shrink-swell potential, cracking hazard, susceptibility to piping, and organic-matter content.

In selecting the reservoir for a farm pond, the features of the subsoil are important, particularly such features as permeability and seepage. An onsite investigation of subsurface drainage should be made before a farm pond is constructed.

In selecting material for the embankments of a farm pond, some of the soil features to be considered are strength and stability, compaction characteristics, and permeability. Enough moderately permeable to slowly permeable material must be available to construct a core wall. Organic soils are not suitable for use as embankment fill. Soils that have high shrink-swell potential are suitable only for constructing the core of embankments.

Agricultural drainage is affected mainly by lack of suitable outlets. Other features that adversely affect drainage are a seasonal high water table, slow permeability, and flood hazard.

Features that adversely affect sprinkler irrigation are low available water capacity, slow infiltration, wetness, and moderately slow or slow permeability. Because of the kinds of crops grown, the practice of sprinkler irrigation is not widespread in these counties.

Woodland [3]

This section contains information about the relationship between soils and trees that can be used by woodland owners and operators in developing and carrying out plans for establishing and harvesting trees in the survey area.

Virgin forest originally covered about 83 percent of the total land area in Bryan and Chatham Counties. The areas of tidal marsh along the eastern seaboard were not wooded. Presently, about 65 percent of the total land area, or 366,000 acres, is wooded. About 115,000 acres of woodland is federally owned land in Fort Stewart and Hunter Air Force Base.

The principal commercial trees on the better drained soils on ridges are slash pine, loblolly pine, longleaf pine, red oak, and hickory. In the depressions, drainageways, bays, and swamps the principal commercial trees are cypress, blackgum, sweetgum, water oaks, willow oaks, sycamore, ash, and tupelo-gum.

Rating soils for woodland use

Most of the soils in Bryan and Chatham Counties have been grouped in table 6 on the basis of their performance when used to produce wood crops. Soils and land types that are not suitable to this use are not rated in the table. Table 6 includes a description of each woodland group, ratings of major hazards and limitations, potential productivity, and trees suitable for planting.

Ratings are based on research, measurements by foresters and soil scientists, and the experience of woodland managers. These ratings can be useful in managing soils for woodland. The terms used in the table are explained in the following paragraphs.

Potential productivity is expressed as site class, or site index, for a given tree species. This is the average height, in feet, of dominant or codominant trees, at age 30 for cottonwood, at age 35 for sycamore, and at age 50 for all other species.

Species suitability is shown by listing the principal commercial trees that are suitable for planting. The selection of preferred species is influenced by their growth rates and by the quality, value, and general marketability of each species.

Important hazards or limitations that affect the suitability of soils for woodland use are (1) potential erosion hazard, (2) equipment limitations, and (3) seedling mortality. The degree of the hazard or limitation is rated slight, moderate, and severe in table 6.

Erosion hazard refers to the susceptibility of the soil to erosion when managed for wood crops. The rating is *slight* if no special management is required. It is *moderate* if some precautions must be taken to prevent accelerated erosion. Roads, skid trails, fire lanes, and landforming require special management. The rating is *severe* if special techniques in management are needed and if roads, skid trails, fire lanes, and landforming require special precautions to minimize accelerated erosion.

Equipment limitation refers to mechanical equipment that is normally used in managing and harvesting trees. The dominant factors that limit the use of equipment are wetness of the soil and unfavorable soil texture. A rating of *slight* indicates that there are no particular limitations on the use of equipment. A rating of *moderate* indicates that not all types of equipment can be used, that there are periods of not more than 3 months when equipment cannot be used because of soil wetness, or that the soils are unstable. A rating of *severe* indicates that the use of some kinds of equipment is limited and special equipment may be needed, that the soil is wet for more than 3 months, or that soil texture limits use of equipment.

Seedling mortality refers to the expected loss of naturally occurring or planted tree seedlings caused by soil characteristics, excluding losses through plant competition. The rating is *slight* where more than 75 percent of the seedlings survive. Natural regeneration or planting can be expected to produce a satisfactory stand. The rating is *moderate* where 50 to 75 percent of the seedlings survive. Natural regeneration cannot always be relied upon for adequate and immediate restocking, and planting may be needed. The rating is *severe* where less than 50 percent of the seedlings survive, and adequate restocking requires additional management; careful planting techniques, superior planting stock, and replanting may also be required to insure that stands are adequate.

Woodland suitability grouping

A woodland suitability group consists of soils that have comparable potential productivity and limitations, produce similar wood crops, and require similar management.

Each group symbol consists of three elements. The first element is a numeral that indicates the relative productive potential of the soils in the group for growing wood crops. It expresses the site quality based on the site index of one or more important trees. The numerals and their ratings are 1, very high potential productivity; 2, high potential productivity; 3, moderately high potential productivity; 4, moderate potential productivity; and 5, low potential productivity.

The second element in the symbol is a small letter that indicates the soil or physiographic characteristic that is the primary cause of hazards, limitations, or restrictions of the soils for woodland use and management. The small letters are w, excessive wetness; s, excessive sandy material in the soil profile; and o, no significant soil-related problem. For soils that have more than one limiting characteristic, only the most limiting characteristic is given.

The third element in the symbol is a numeral that indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The numeral 1 indicates that the soils have no significant limitations and are best suited to needleleaf trees; 2 indicates that the soils have one or more moderate limitations and are best suited to needleleaf trees; 3 indicates that the soils have one or more severe limitations and are best suited to needleleaf trees; 4 indicates that the soils have no significant limitations and are best suited to broadleaf

[3] W. P. THOMPSON, forester, Soil Conservation Service, assisted in the preparation of this subsection. Information was gathered in the field by teams of foresters and soil scientists. Representatives of Federal and State agencies, the wood-using industry, and others cooperated in gathering field data.

TABLE 6.—*Woodland suitability groups*

[Soils and land types not assigned to a woodland group, because trees do not grow on them or the productivity is too low for commercial stands, are Capers soils (Ch), Chipley-Urban land complex (Cuc), Coastal beach (Cub), Fresh water swamp (Fws), Kershaw-Osier complex (Kic), Made land (Mae), Ocilla-Urban land complex (Ojc), Ogeechee-Urban land complex (Okc), Tidal marsh, fresh (Tmh), Tidal marsh, salty (Tml), and Wahee-Urban land complex (Wac)]

Woodland group and map symbols	Potential productivity		Species suitable for planting
	Tree species	Site class	
1w9: Excessively wet soils that have a loamy surface layer and a loamy or clayey subsoil or underlying layer; very high potential productivity; severe equipment limitations and seedling mortality in areas without adequate surface drainage; suited to needleleaf and broadleaf trees. Je, Mba.	Slash pine [1] Loblolly pine [1] Water oak [1] Pond pine	100 100 90–100 80	Loblolly pine,[2] slash pine,[2] sweetgum,[2] water tupelo, sycamore, cherrybark oak.[2]
2o1: Soil that has a sandy surface layer and a loamy subsoil; high potential productivity; no serious management problems; well suited to needleleaf trees. Da.	Loblolly pine Slash pine Longleaf pine	90 90 70	Slash pine, loblolly pine.
2w2: Seasonally wet sandy soil that has high potential productivity; moderate equipment limitations; slight to moderate seedling mortality; well suited to needleleaf trees. Cm.	Loblolly pine Slash pine Longleaf pine	90 90 70	Loblolly pine, slash pine.
2w3: Excessively wet soils that have a sandy surface layer and a loamy subsoil; high potential productivity; severe equipment limitations and seedling mortality in areas without adequate surface drainage; well suited to needleleaf trees. Ok, Pl.	Loblolly pine Slash pine Longleaf pine	90 90 70	Slash pine, loblolly pine.
2w8: Seasonally wet soil that has a loamy surface layer and a clayey subsoil; high potential productivity; moderate equipment limitations; slight to moderate seedling mortality; suited to needleleaf trees, broadleaf trees, or both. Waf.	Loblolly pine Slash pine Sweetgum Yellow-poplar Water oak	90 90 90 100 90	Loblolly pine, slash pine, yellow-poplar, sycamore, sweetgum, cherrybark oak.
2w9: Excessively wet soils that have a sandy or loamy surface layer and a mainly loamy or clayey subsoil or underlying layer; high potential productivity; severe equipment limitations and seedling mortality in areas without adequate surface drainage; suited to broadleaf trees, needleleaf trees, or both. AB, Cc, El, Pn.	Loblolly pine [1] Slash pine [1] Cypress Sweetgum Tupelo	90 90	Loblolly pine,[2] slash pine,[2] sweetgum,[2] sycamore,[2] tupelo.
3s2: Soils that have a thick sandy surface layer and a loamy subsoil; moderately high productivity; moderate equipment limitations and seedling mortality; well suited to needleleaf trees. Fs, LMD, Se.	Slash pine Loblolly pine Longleaf pine	80 80 60–70	Slash pine, longleaf pine.
3w2: Mainly seasonally wet soils that have a sandy surface layer and a loamy or clayey subsoil; moderately high potential productivity; moderate equipment limitations; slight to moderate seedling mortality; well suited to needleleaf trees. As, Cx, Mn, Oj, Ol.	Loblolly pine Slash pine Longleaf pine	80 80 70	Slash pine, loblolly pine.
3w3: Excessively wet, sandy soil that has moderately high potential productivity; severe equipment limitations and seedling mortality in areas without adequate surface drainage; well suited to needleleaf trees. Om.	Loblolly pine [1] Slash pine [1] Longleaf pine [1]	80 80 70	Slash pine,[2] loblolly pine.[2]
4s2: Sandy soil that has moderate productivity; moderate equipment limitations and seedling mortality; well suited to needleleaf trees. Lp.	Slash pine Loblolly pine Longleaf pine	70 70 60	Longleaf pine, slash pine.
4w2: Excessively wet, sandy soil that has moderate productivity; moderate seedling mortality and equipment limitations; well suited to needleleaf trees. Lr.	Slash pine Loblolly pine Longleaf pine	70 70 60	Slash pine, loblolly pine.
4w3: Excessively wet soil that has a sandy surface layer and a loamy subsoil; moderate productivity; severe equipment limitations and seedling mortality; suited to needleleaf trees. LQ.	Slash pine [1] Loblolly pine [1]	70 70	Slash pine,[2] loblolly pine.[2]
5s3: Sandy soil that has low productivity; severe seedling mortality; moderate equipment limitations; best suited to needleleaf trees. KkC.	Longleaf pine Slash pine	50 60	Longleaf pine, slash pine.

[1] Potential productivity is attainable only in areas where surface drainage is adequate.

[2] Tree planting is feasible only in areas where surface drainage is adequate.

trees; 5 indicates that the soils have one or more moderate limitations and are best suited to broadleaf trees; 6 indicates soils that have one or more severe limitations and are best suited to broadleaf trees; 7 indicates that the soils have no significant limitations and are well suited to needleleaf or broadleaf trees; 8 indicates that the soils have one or more moderate limitations and are well suited to needleleaf or broadleaf trees; 9 indicates that the soils have one or more severe limitations and are suited to needleleaf or broadleaf trees. Soils in Bryan and Chatham Counties did not require the use of numerals 4, 5, 6 and 7.

The woodland group to which each mapping unit is assigned can be determined by referring to the "Guide to Mapping Units" at the back of this survey, or to the description of the mapping unit.

Wildlife [4]

Wildlife requires food, cover, and water in a suitable combination. Lack of any one of these requirements, an unfavorable balance between them, or an inadequate distribution of them may severely limit or account for the absence of desired wildlife species. Knowledge of the soils is valuable in establishing, improving, or maintaining suitable food plants, cover plants, and water for wildlife.

Most wildlife habitats are managed by planting suitable vegetation, by improving existing vegetation so as to bring about a favorable habitat and an increase of the number of desired plants, or by a combination of such measures. The degree of suitability of many soils for various plants is known, and it can be estimated for other soils from a knowledge of soil characteristics and behavior. Water areas can be established or natural ones improved as wildlife habitats.

Ratings of the suitability of soils for wildlife habitat are given in table 7. These ratings can be used to select the more suitable sites for various kinds of habitat and estimate the level of management needed to achieve satisfactory results. They also show that it may not be feasible to manage a particular area for a given kind of wildlife. The ratings can be used in broad-scale planning of wildlife areas, parks, and nature areas, or in acquiring land suited to wildlife.

The areas shown on the soil survey maps were rated without regard to their relation with adjoining mapped areas. Also, the size, shape, or location of the mapped areas does not affect the rating. Certain influences on habitats, such as elevation and aspect, must be appraised on the site.

In table 7, the soils of the survey area are rated for their relative suitability for the establishment, improvement, or maintenance of seven wildlife habitat elements. These ratings are based on limitations caused by the characteristics or behavior of the soils. Four levels of suitability are recognized—well suited, suited, poorly suited, and unsuited. These ratings also indicate the relative extent of a particular soil limitation. For example, a rating of suited for a habitat element limited by flooding shows that the limitation is only moderate. For another element, the same degree of flooding may be a severe limitation and the rating may be poorly suited or unsuited.

To determine the principal limiting factor or factors that are a basis for a rating, the soil descriptions should be consulted. One unfavorable property may magnify the effect of another. For example, a shallow root zone intensifies the detrimental effect of a low available water capacity.

The basis of ratings for coniferous woody plant habitat requires an explanation. If tree growth is slow and closure of the canopy is delayed, coniferous habitats support a larger number and variety of wildlife than when tree growth and canopy closure are rapid. Soil properties, therefore, that tend to promote rapid tree growth and canopy closure are limitations.

In general, soil conditions that favor quick establishment and rapid growth of conifers also favor hardwoods. Because hardwood trees generally become dominant, a higher level of management is required for establishing, improving, or maintaining conifer habitat.

The ratings in table 7 are defined in the following paragraphs.

Well suited means that soil limitations are negligible for the designated habitat element. Generally, the intensity of management required for the establishment, improvement, or maintenance of the habitat element is low, and satisfactory results can be expected.

Suited means that soil limitations are moderate for the designated habitat element. Fairly frequent attention and a moderately intensive management are required to achieve satisfactory results.

Poorly suited means that soil limitations are severe. The establishment, improvement, or maintenance of the designated habitat element is difficult, may be expensive, and requires intensive management to achieve satisfactory results.

Unsuited means that soil limitations are so severe that it is highly impractical, if not impossible, to manage the soil for the designated habitat element.

The elements of wildlife habitat and the kinds of wildlife rated in table 7 are defined in the following paragraphs.

Grain crops.—Farm grains or seed-producing annuals planted to produce food for wildlife. Examples are corn, sorghum, rye, oats, millet, soybeans, peas, and proso.

Grasses and legumes.—Domestic perennial grasses and herbaceous legumes that are established by planting and that furnish wildlife food and cover. Examples are fescue, bromegrass, lovegrass, reed canarygrass, panicgrass, bahiagrass, white clover, trefoil, and annual, perennial, and shrub lespedezas.

Wild herbaceous upland plants.—Native or introduced perennial grasses and forbs (weeds) that provide food and cover principally to upland wildlife, and that are established mainly through natural processes. Examples are bluestem, wild ryegrass, oatgrass, pokeweed, lespedeza, beggarweed, wild beans, nightshade, goldenrod, dandelions, cheat, poorjoe, ragweed, and crotons.

Hardwood woody plants.—Nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, twigs (browse), or foliage used extensively as food by wildlife and that commonly are established through natural processes but also may be planted. Examples are oak,

[4] PAUL D. SCHUMACHER, biologist, Soil Conservation Service, helped prepare this section.

TABLE 7.—*Suitability of the soils for*

[Urban land com

Soil name and map symbol	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Albany: As	Suited	Suited	Suited	Suited
Angelina: AB	Unsuited	Unsuited	Poorly suited	Suited
Bibb	Unsuited	Unsuited	Poorly suited	Suited
Mapped only with Angelina soils.				
Cape Fear: Cc	Unsuited	Poorly suited	Poorly suited	Suited
Capers: Ch	Unsuited	*Unsuited*	Unsuited	Unsuited
Chipley: Cm	*Suited*	Suited	Suited	Suited
Coastal beach: Cub	Unsuited	Unsuited	Unsuited	Unsuited
Craven: Cx	Suited	Well suited	Well suited	Well suited
Dothan: Da	Well suited	Well suited	Well suited	Well suited
Ellabelle: El	Unsuited	Poorly suited	Poorly suited	Suited
Fresh water swamp: Fws	Unsuited	Unsuited	Unsuited	Suited
Fuquay: Fs	Suited	Well suited	Well suited	Suited
Johnston: Je	Unsuited	Unsuited	Poorly suited	Suited
Kershaw: KkC, Kic	Unsuited	Poorly suited	Unsuited	Poorly suited
Lakeland: Lp	Poorly suited	Suited	Poorly suited	Suited
Leon: Lr	Poorly suited	Poorly suited	Poorly suited	Poorly suited
Lucy: LMD	Suited	Suited	Well suited	Suited
Lynn Haven: LQ	Unsuited	Poorly suited	Poorly suited	Suited
Made land: Mae	Unsuited	Unsuited	Unsuited	Unsuited
Mascotte: Mn	Poorly suited	Suited	Suited	Poorly suited
Meggett: Mba	Unsuited	Poorly suited	Poorly suited	Well suited
Ocilla: Oj	Suited	Well *suited*	Well suited	Suited
Ogeechee: Ok	*Poorly* suited	Poorly suited	Suited	Suited
Olustee: Ol	Suited	Suited	Suited	Suited
Osier: Om	Unsuited	Poorly suited	Poorly suited	Well suited
Pelham: Pl	Poorly suited	Poorly suited	Suited	Suited
Pooler: Pn	Unsuited	Suited	Suited	Well suited
Stilson: Se	Suited	Well suited	Well suited	Suited
Tidal marsh, fresh: Tmh	Unsuited	Unsuited	Unsuited	Unsuited
Tidal marsh, salty: Tml	Unsuited	Unsuited	*Unsuited*	Unsuited
Wahee: Waf	Poorly suited	Suited	Well suited	Well suited

crabapple, cherry, hawthorn, dogwood, viburnum, maple, birch, poplar, grapes, honeysuckle, blueberry, huckleberry, briers, greenbriers, autumn olive, multiflora rose, yaupon, blackgum, tupelo, bays, and myrtles.

Coniferous woody plants.—Cone-bearing trees and shrubs, important to wildlife mainly as cover, but also may furnish food in the form of browse, seeds, or fruitlike cones; plants commonly are established through natural processes but also may be planted. Examples are pine and redcedar.

Wetland food and cover plants.—Annual and perennial, wild herbaceous plants in moist to wet sites, exclusive of submerged or floating aquatics that produce food or cover that is extensively and dominantly used by wetland wildlife. Examples are smartweed, wild millet, bullrush, spike sedge, rushes, sedges, burreeds, wild rice, rice cutgrass, mannagrass, cattails, and cordgrasses.

Shallow water developments.—Impoundments or excavations for control of water, generally not more than 6 feet deep. Examples are dikes and levees, shallow dugouts, level ditches, and devices for controlling the water level in marshy drainageways, marshes, or channels.

Ponds.—Dug-out water areas or combinations of dug-out areas and low dikes (dammed areas) that have water of suitable quality, of suitable depth, and in ample supply for producing fish or wildlife. Examples are ponds that are built on nearly level soils and that have at least one-fourth acre of surface area, an average depth of 5 feet for at least one-fifth of their area, and a dependably high water table or other source of water.

Open-land wildlife.—Quail, doves, cottontail rabbit, fox, meadow lark, field sparrows, and other birds and mammals that normally live on cropland, pasture, meadow, lawns, and in other open land areas where grasses, herbs, and shrubbery plants are grown.

Woodland wildlife.—Deer, raccoon, squirrel, wild turkey, thrush, vireo, and other birds and mammals that normally live in wooded areas where hardwood trees and shrubs and coniferous trees are grown.

Wetland wildlife.—Ducks, geese, marsh hens, heron, shore birds, mink, alligator, and other birds and animals that normally live in wet areas, marshes, and swamps.

Use of the Soils for Cultivated Crops and Pasture [6]

In this section the system of capability grouping used by the Soil Conservation Service is explained and the capability units in Bryan and Chatham Counties are listed. Estimated acre yields of the principal crops are given in a table, and the management required to obtain these yields is described.

[6] JOHN B. HUNGERFORD, conservation agronomist, Soil Conservation Service, helped prepare this section.

elements of wildlife habitat and kinds of wildlife

plexes are not listed]

Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Kinds of wildlife		
			Open land	Woodland	Wetland
Poorly suited	Unsuited	Poorly suited	Suited	Suited	Unsuited.
Suited	Well suited	Suited	Unsuited	Suited	Suited.
Suited	Well suited	Suited	Unsuited	Suited	Suited.
Well suited	Well suited	Well suited	Unsuited	Suited	Well suited.
Unsuited	Suited	Suited	Unsuited	Unsuited	Suited.
Poorly suited	Unsuited	Poorly suited	Suited	Suited	Unsuited.
Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited.
Poorly suited	Unsuited	Poorly suited	Suited	Well suited	Poorly suited.
Suited	Unsuited	Unsuited	Well suited	Well suited	Unsuited.
Well suited	Well suited	Well suited	Unsuited	Suited	Well suited.
Unsuited	Well suited	Well suited	Unsuited	Poorly suited	Well suited.
Suited	Unsuited	Unsuited	Suited	Suited	Unsuited.
Unsuited	Well suited	Suited	Unsuited	Poorly suited	Suited.
Suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Unsuited.
Suited	Unsuited	Poorly suited	Poorly suited	Poorly suited	Poorly suited.
Poorly suited	Unsuited	Unsuited	Suited	Suited	Unsuited.
Well suited	Suited	Suited	Poorly suited	Poorly suited	Poorly suited.
Unsuited	Suited	Poorly suited	Unsuited	Unsuited	Poorly suited.
Suited	Poorly suited	Poorly suited	Poorly suited	Suited	Poorly suited.
Suited	Well suited	Well suited	Poorly suited	Suited	Well suited.
Suited	Poorly suited	Poorly suited	Suited	Well suited	Poorly suited.
Suited	Well suited	Well suited	Poorly suited	Suited	Well suited.
Poorly suited	Unsuited	Poorly suited	Suited	Suited	Unsuited.
Suited	Well suited	Suited	Unsuited	Well suited	Well suited.
Suited	Well suited	Well suited	Poorly suited	Suited	Well suited.
Poorly suited	Suited	Well suited	Poorly suited	Suited	Suited.
Poorly suited	Unsuited	Unsuited	Suited	Suited	Unsuited.
Unsuited	Well suited	Suited	Unsuited	Unsuited	Well suited.
Unsuited	Suited	Suited	Unsuited	Unsuited	Suited.
Poorly suited	Poorly suited	Suited	Poorly suited	Well suited	Suited.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideraton possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, all kinds of soil are grouped at three levels, the capability class, subclass, and unit. These are described in the following paragraphs.

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use.

Capability Subclasses are soil groups within one class; they are designated by adding a smaller letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can obtain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIs–1 or IVw–4. Thus, in one symbol, the Roman numeral desig-

nates the capability class, or degree of limitation, and the small letter indicates the subclass, or kind of limitations, as defined in the foregoing paragraph. The Arabic numeral specifically identifies the capability unit within each subclass. A statewide system of numbering is used. Numbers for capability units are not consecutive in Bryan and Chatham Counties because not all of the different units established in Georgia occur in these counties.

Capability units in Bryan and Chatham Counties

The soils in Bryan and Chatham Counties have been grouped into 19 capability units. The soils in each unit have about the same limitations and susceptibility to damage, need about the same management, and respond to management in about the same way. In the following outline each capability unit is described, but management and suitable crops for the soils of each unit are suggested in the description of each mapping unit. To find the capability unit of each soil in the survey area, refer to the "Guide to Mapping Units" at the back of the survey.

Class I. Soils that have few limitations that restrict their use. (None in Bryan and Chatham Counties.)

Class II. Soils that have moderate limitations that reduce the choice of plants or require moderate conservation practices.

- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw–2. Nearly level, moderately well drained soils that have a sandy surface layer and loamy subsoil; mainly on uplands.
  - Unit IIw–3. Nearly level to very gently sloping, moderately well drained soils that have a sandy surface layer and a clayey layer in the subsoil; on uplands.
- Subclass IIs. Soils that have moderate limitations because of water capacity.
  - Unit IIs–1. Nearly level to very gently sloping, well-drained soils that have a sandy surface layer and loamy subsoil; on uplands.

Class III. Soils that have severe limitations that reduce the choice of plants, require special conservation practices, or both.

- Subclass IIIw. Soils that have severe limitations because of excess water.
  - Unit IIIw–1. Nearly level to very gently sloping, somewhat poorly drained to poorly drained soils that have a sandy surface layer and loamy or sandy subsoil, or soils that have been altered for urban use; mainly on uplands.
  - Unit IIIw–2. Nearly level, somewhat poorly drained soils that have a loamy surface layer and a clay layer in the subsoil; on low uplands.
  - Unit IIIw–4. Nearly level, poorly drained soils that have a sandy surface layer, an organic-stained subsurface layer, and a loamy subsoil; on low uplands.
  - Unit IIIw–5. Nearly level, somewhat poorly drained soils that have a sandy surface layer and a clayey layer in the subsoil, and soils that have been altered for urban use; on broad flats, in depressions, and in drainageways.
- Subclass IIIs. Soils that have severe limitations because of water capacity.
  - Unit IIIs–1. Nearly level to very gently sloping, moderately well drained, sandy soils, and soils that have been altered for urban use; on uplands.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

- Subclass IVw. Soils that have very severe limitations because of excess water.
  - Unit IVw–3. Nearly level, poorly drained sandy soils that have an organic-stained subsurface layer; in ponded or wet areas.
  - Unit IVw–4. Nearly level, poorly drained soils that are sandy to a depth of about 24 inches and have a loamy subsoil; in drainageways, on flats, and in depressions.
- Subclass IVs. Soils that have very severe limitations because of water capacity.
  - Unit IVs–1. Nearly level to sloping, droughty soils that are sandy to a depth of about 22 inches or more and have a loamy or sandy subsoil or underlying layer; on uplands.

Class V. Soils on which the erosion hazard is little or none, but other limitations impractical to remove limit their use largely to pasture, woodland, or wildlife habitat.

- Subclass Vw. Soils too wet for cultivation on which drainage or protection from flooding is not feasible.
  - Unit Vw–1. Nearly level, somewhat poorly drained and very poorly drained soils that have a sandy or loamy surface layer and a loamy or clayey subsoil; in low-lying areas.
  - Unit Vw–2. Nearly level, very poorly drained, loamy soils; on stream flood plains.
  - Unit Vw–3. Nearly level, poorly drained soils that are sandy to a depth of 60 inches or more; mainly in depressions.

Class VI. Soils that have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, range, woodland, or wildlife habitat. (None in Bryan and Chatham Counties.)

Class VII. Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife habitat.

- Subclass VIIw. Soils that have very severe limitations because of excess water.
  - Unit VIIw–1. Nearly level, poorly drained and very poorly drained soils that have a sandy or loamy surface layer and a loamy subsoil, and land types; on stream flood plains.
  - Unit VIIw–2. Fresh water tidal marshland.
  - Unit VIIw–3. Salty tidal marshland, made land, and very poorly drained marshland soils that have a loamy surface layer and clayey subsoil.
- Subclass VIIs. Soils that have very severe limitations because of water capacity.
  - Unit VIIs–1. Chiefly nearly level to gently sloping, droughty, sandy soils.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial plant production

and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes.

Subclass VIIIs. Soils and landforms that have limitations that limit their use mainly to recreation, wildlife habitat, and esthetic purposes because they are sandy.

Unit VIIIs–1. Coastal beach.

Estimated yields

Table 8 gives estimated acre yields for principal crops and pasture plants grown in Bryan and Chatham Counties under a high level of management. These yields are based on records of actual yields on individual farms, on yields obtained in long term experiments, and on estimates made by agronomists familiar with the soils. Estimates are not made for some of the soils, because yields would be too low to make production practical if crops were grown, or because more intensive management than is feasible would be required.

The following soils and land types generally are not used for the crops listed in table 8 and are not included in the table: Capers soils, Chipley-Urban land complex, Coastal beach, Fresh water swamp, Kershaw coarse sand, 2 to 8 percent slopes, Kershaw-Osier complex, Made land, Ocilla-Urban land complex, Ogeechee-Urban land complex, Tidal marsh, fresh, Tidal marsh, salty, and Wahee-Urban land complex.

The management required to obtain the yields for each crop shown in table 8 is described in the following paragraphs.

Corn.—Applying 100 to 160 pounds of nitrogen (N) per acre, 60 to 75 pounds of phosphoric acid (P_2O_5), and 80 to 105 pounds of potash (K_2O); planting enough seed to produce 12,000 to 14,000 plants per acre; turning under all crop residue or growing a winter cover crop and turning it under.

Cotton.—Applying 90 to 120 pounds of nitrogen (N), 70 to 85 pounds of phosphoric acid (P_2O_5), and 100 to 120 pounds of potash (K_2O) per acre; planting enough seed to produce 40,000 to 60,000 plants per acre; providing effective control of insects.

Tobacco (flue-cured).—Applying 1,400 pounds of 4–8–12 or 1,600 to 1,800 pounds of 5–10–15 fertilizer before planting; setting 7,000 to 8,000 plants per acre; providing effective nematode and insect control.

Soybeans.—Applying 15 to 20 pounds of nitrogen (N), 40 to 50 pounds of phosphoric acid (P_2O_5), and 60 to 100 pounds of potash (K_2O) per acre; applying 1 ton of lime per acre at 3-year intervals; planting enough seed to produce 200,000 plants (about 1 bushel) per acre; providing adequate insect control.

Peanuts.—Applying 10 to 20 pounds of nitrogen (N), 40 to 50 pounds of phosphoric acid (P_2O_5), and 60 to 75 pounds of potash (K_2O); topdressing with 400 to 600 pounds of gypsum; planting about 90 to 100 pounds of seed per acre.

Small grain.—Applying 80 to 90 pounds of nitrogen (N), 40 to 70 pounds of phosphoric acid (P_2O_5), and 70 to 90 pounds of potash (K_2O) per acre.

Coastal bermudagrass.—Applying 25 to 30 pounds of nitrogen (N), 50 to 60 pounds of phosphoric acid (P_2O_5), and 80 to 120 pounds of potash (K_2O) per acre early in spring and 140 to 160 pounds of additional nitrogen (N) per acre as topdressing; providing adequate insect and weed control.

Bahiagrass.—Applying 25 to 30 pounds of nitrogen (N), 50 to 70 pounds of phosphoric acid (P_2O_5), and 75 to 90 pounds of potash (K_2O) per acre early in spring and later 80 to 110 pounds of nitrogen (N) per acre as topdressing; planting 20 to 30 pounds of seed per acre.

Formation and Classification of the Soils

This section tells how the factors of soil formation have affected the development of soils in Bryan and Chatham Counties, explains the current system of soil classification, and shows the classification of the soil series according to the higher categories of the current system.

Factors of Soil Formation

Soil is produced when parent material, climate, relief, and plants and animals interact for a period of time. These factors determine the nature of the soil that forms at any point on the earth. All of these factors affect the formation of each soil, but the relative importance of each factor differs from place to place. In some areas one factor may dominate in the formation of a soil and determine most of its properties, as is common where the parent material is pure quartz sand. Quartz sand is highly resistant to weathering, and soils formed in it generally have faint horizons. Even in quartz sand, however, a distinct profile can be formed under certain kinds of vegetation if the relief is low and flat and if the water table is high as it is in Leon soils. The five factors of soil formation and their relation to the formation of soils in the survey area are described in the paragraphs that follow.

Parent material

Parent material is the unconsolidated mass from which soil forms. It largely determines the chemical and mineralogical composition of a soil. The soils in Bryan and Chatham Counties formed from transported materials.

The area shows evidence that the land was submerged by the ocean in stages (*6*). This is especially true for those areas less than 40 feet above sea level. The formation of barrier islands, tidal marshes, and lagoons during each stage promoted the sorting and mixing of the sediments. As the ocean retreated to its present position, soil-forming processes developed the soils as we know them today. Barrier islands of sand were formed by tides and winds, and these islands were left as the sea level dropped. The sandy Lakeland, Chipley, Osier, and Kershaw soils developed in these sandy materials. Because of their sandy origin, these soils have faintly developed horizons. Lagoonal-tidal marsh sediments are characterized by mixed sand, silt, and clay. Capers soils developed from clay in present tidal marshes, and Pooler, Meggett, Ogeechee, and Cape Fear soils developed from clayey deposits in relics of lagoons and tidal marshes. Albany, Craven, Ellabelle, Pelham, Wahee, and Olustee soils developed from mixed sand and clay sediments that were affected by tidal streams and estuaries.

TABLE 8.—*Estimated acre yields of the principal crops and pasture plants grown under a high level of management*

[Yields are for nonirrigated soils. Absence of yield means that the crop is not suited to the soil or generally is not grown on it]

Soil	Corn	Cotton lint	Tobacco	Soybeans	Peanuts	Small grain pasture	Coastal bermudagrass		Bahiagrass pasture
							Hay	Pasture	
	Bu.	*Lb.*	*Lb.*	*Bu.*	*Lb.*	*A-U-M*[1]	*Tons*	*A-U-M*[1]	*A-U-M*[1]
Albany fine sand	65		2,000	25	1,500	3	4.5	7.5	6.5
Angelina and Bibb soils, frequently flooded									3.5
Cape Fear soils									4.5
Chipley fine sand	55		2,000	20		3	4.5	7.5	6.5
Craven loamy fine sand	75			35		3	3.5	5.8	6.0
Dothan loamy sand	85	625	2,200	40	2,000	3	5.5	9.2	8.0
Ellabelle loamy sand									5.0
Fuquay loamy sand	80	500	2,300	30	2,900	3	4.5	7.5	6.5
Johnston loam									3.5
Lakeland sand	55		1,400	20		2	3.5	5.8	4.5
Leon fine sand	50								4.5
Lucy loamy sand, 5 to 12 percent slopes	60			30	1,800	3	4.0	6.7	6.5
Lynn Haven sand	50					3			3.0
Mascotte sand	50								4.5
Meggett loam									4.5
Ocilla complex	65			30		3	4.5	7.5	7.0
Ogeechee loamy fine sand	65					3			5
Olustee fine sand	70		2,200	25		3	4.5	7.5	5
Osier fine sand									5
Pelham loamy sand	70					3		4.0	5.5
Pooler fine sandy loam							4	6.7	5.5
Stilson loamy sand	80		2,400	30	2,200	3.5	5.5	9.2	7.0
Wahee sandy loam	80			35		3	4	6.7	5.5

[1] Animal-unit-month. This term is used to express the carrying capacity of pasture. It is the number of animal units (1 cow, steer, or horse; 5 hogs; or 7 sheep or goats) that can graze a pasture for 1 month without injury to the sod. An acre of pasture that provides 2.5 months of grazing for 2 cows, for example, has a carrying capacity of 5 animal-unit-months.

The older areas more than 40 feet above sea level have been somewhat eroded, and the land features showing marine influences are not so distinct as in the lower areas. The soils at the higher elevation are similar in both chemical and mineralogical composition to those of lower areas, and geological erosion has exposed older deposits to the soil-forming processes. Lucy and Dothan soils developed from older exposed sediments.

The Angelina, Bibb, and Johnston soils formed in recent alluvium that washed from the Coastal Plain and was deposited by the larger streams. These materials are mixed sand and clay and are within the stream flood plain.

A series of sand ridges are on the northeast side of the Ogeechee and Canoochee Rivers and on the present barrier islands. These ridges are quartz sand probably deposited by wind. Kershaw soils formed in this sand.

Climate

Climate affects the formation of soils through its influence on the rate of weathering of rocks and on the decomposition of minerals and organic matter. It also affects biological activity in the soils and the leaching and movement of weathered materials through the soils.

Bryan and Chatham Counties have a warm, moist climate. The average annual temperature is about 66° F. The temperature averages about 51° in January and about 81° in July. The average annual rainfall is between 45 and 50 inches. The warm, moist climate promotes decomposition of organic matter almost the year round, and only where the soils are waterlogged do appreciable amounts of organic matter accumulate. The abundant rainfall removes calcium, magnesium, and other basic elements and replaces these cations with hydrogen. As a result, hydrogen is the dominant cation and makes most of the soils highly acid in reaction. Also, the movement of water through the soil translocates other soluble material and colloidal matter into the lower layers. The result is that the soils in Bryan and Chatham Counties have chiefly a sandy surface layer over clay-enriched layers. Exceptions are the Kershaw, Lakeland, and Chipley soils, which formed in quartz sand.

Relief

Relief, or the differences in elevation, influences soil formation through its effect on drainage, runoff, erosion, and percolation of both water and air through the soils.

Precipitation is not absorbed by the soil where the rainfall rate is faster than the infiltration rate or where the soil is already saturated with free water. Low-lying areas stay wet for extended periods. When a soil is wet, decomposition of plant tissue is retarded. Consequently, more organic matter accumulates in the surface layer of poorly drained and very poorly drained soils than in better drained soils. Because relief is low throughout most

of the survey area, the soils in about 60 percent of the acreage are poorly drained or very poorly drained.

The greatest differences in relief in the survey area occur in Bryan County west of the Ogeechee River and north of the Canoochee River. Elevation increases from about 30 feet to about 80 feet above sea level within a mile, and the slopes are steep enough for geological erosion to lower the streams well below the general land surface. Most of the well-drained soils occur in this part of the survey area.

In saturated soils, movement of air is restricted and the oxygen content is lower than in well-drained soils. Oxygen is removed from some of the iron and aluminum compounds of the subsoil, causing gray mottles or dominant gray colors in the B horizon. This explains why the Pelham, Ellabelle, and other poorly drained and very poorly drained soils have dominant gray colors just below the surface layer, why the Ocilla and other somewhat poorly drained soils have gray mottles in the upper part of the B horizon, and why the Fuquay and other well-drained soils have uniform yellow to red colors free of gray mottles to a depth of at least 3 to 4 feet.

Plants and animals

Plants, animals, bacteria, and other organisms are active in the soil-forming processes. The changes they bring about depend mainly on the kinds of life processes peculiar to each. Plants furnish most of the organic matter available to the soil. Grass-type vegetation returns to the soil most of the plant tissue produced each year. Forest vegetation, however, returns only part of the tissue in the form of leaves. Organic matter accumulates mainly in the surface layer.

In about 75 percent of the acreage of the survey area, the soils formed under forest vegetation. The organic matter produced under forest is enough to give the surface layer a dark color and an organic-matter content of about 1 to 3 percent. It is not enough to add appreciable amounts of organic matter to the surface layer except where excess water slows decomposition. If waterlogged, the surface layer has higher organic-matter content and is darker and thicker than it is in drier areas. The uprooting of trees by wind also affects the formation of soils through the mixing of soil layers.

About 25 percent of the survey area has marsh or grass-type vegetation, and the surface layer is higher in organic-matter content than in forested areas. The surface layer in marsh soils contains as much as 15 percent organic matter in some places.

Small animals, earthworms, insects, and micro-organisms influence the formation of soils by mixing organic matter into the soil and by helping to break down plant residue. Small animals burrow into the soil and mix the layers. Earthworms and other small invertebrates feed on the organic matter in the upper few inches. They slowly but continually mix the soil material and may alter it chemically. Bacteria, fungi, and other micro-organisms hasten the decomposition of organic matter and the weathering of minerals.

Time

The alteration of soil materials so that deep, distinct layers develop in the soil requires time. The length of time that geologic materials have remained in place is commonly reflected in the distinctness and thickness of the horizons in the soil profile.

Craven soils formed in parent material that is less than 35 feet above sea level and have distinct layers. Dothan soils formed from geologically older parent material that is more than about 70 feet above sea level. They have had more time to form and their clay-enriched layers are thicker than those in the Craven soils. Also, Dothan soils have concentrations of oxides in the form of concretions and soft plinthite.

The parent material of Angelina and Bibb soils has been recently deposited by streams. These soils lack distinct genetic layers because the soil-forming processes have not had time to alter the parent material appreciably since it was deposited.

The sandy soils that formed in homogeneous deposits of quartz sand typically lack distinct genetic layers because quartz sand resists alteration by the soil-forming processes.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*3*) and revised later (*8*). The system currently used by the National Cooperative Soil Survey was developed early in the sixties (*7*) and adopted in 1965 (*10*). It is under continual study.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 9 shows the classification of each soil series of Bryan and Chatham Counties by family, subgroup, and order, according to the current system. The six classes in the current system are defined in the paragraphs that follow.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil order are those that tend to give broad climatic groupings of soils. The exceptions, Entisols and Histosols, occur in many different climates. Five soil orders are represented in Bryan and Chatham Counties—Entisols, Inceptisols, Spodosols, Alfisols, and Ultisols.

TABLE 9.—*Soil series classified according to the current system of classification*

Series	Family	Subgroup	Order
Albany	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.
Angelina [1]	Fine-loamy, mixed, acid, thermic	Typic Haplaquents	Entisols.
Bibb	Coarse-loamy, siliceous, acid, thermic	Typic Haplaquents	Entisols.
Cape Fear [2]	Clayey, mixed, thermic	Typic Umbraquults	Ultisols.
Capers [3]	Fine, mixed, sulfureous, thermic	Typic Hydraquents	Entisols.
Chipley	Siliceous, thermic, coated	Aquic Quartzipsamments	Entisols.
Craven	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Dothan	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Ellabelle	Loamy, siliceous, thermic	Arenic Umbric Paleaquults	Ultisols.
Fuquay	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Johnston	Coarse-loamy, siliceous, acid, thermic	Cumulic Humaquepts	Inceptisols.
Kershaw [4]	Siliceous, thermic, uncoated	Typic Quartzipsamments	Entisols.
Lakeland	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Leon	Sandy, siliceous, thermic	Aeric Haplaquods	Spodosols.
Lucy	Loamy, siliceous, thermic	Arenic Paleudults	Ultisols.
Lynn Haven [5]	Sandy, siliceous, thermic	Typic Haplaquods	Spodosols.
Mascotte	Sandy over loamy, siliceous, thermic	Ultic Haplaquods	Spodosols.
Meggett	Fine, mixed, thermic	Typic Albaqualfs	Alfisols.
Ocilla	Loamy, siliceous, thermic	Aquic Arenic Paleudults	Ultisols.
Ogeechee	Fine-loamy, siliceous, thermic	Aeric Ochraquults	Ultisols.
Olustee	Sandy over loamy, siliceous, thermic	Ultic Haplaquods	Spodosols.
Osier [6]	Siliceous, thermic	Typic Psammaquents	Entisols.
Pelham	Loamy, siliceous, thermic	Arenic Paleaquults	Ultisols.
Pooler	Clayey, mixed, thermic	Aeric Ochraquults	Ultisols.
Stilson	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Wahee [7]	Clayey, kaolinitic, thermic	Aeric Ochraquults	Ultisols.

[1] The Angelina soils in these counties are taxadjuncts to the Angelina series because they have siliceous rather than mixed mineralogy. They are enough like the Angelina soils in morphology, composition, and behavior that a new series is not warranted.

[2] The Cape Fear soils in these counties are taxadjuncts to the Cape Fear series because they contain less silt and more sand than is typical. They are enough like the Cape Fear soils in morphology, composition, and behavior that a new series is not warranted.

[3] The classification of the Capers series is tentative.

[4] The Kershaw soils in mapping unit Kershaw-Osier complex are taxadjuncts to the Kershaw series because they have paler colors in the C horizon. They are enough like the Kershaw soils in morphology, composition, and behavior that a new series is not warranted.

[5] The Lynn Haven soils in these counties are taxadjuncts to the Lynn Haven series because they lack an A2 (albic horizon). They are enough like the Lynn Haven soils in morphology, composition, and behavior that a new series is not warranted.

[6] The Osier soils in these counties are taxadjuncts to the Osier series because they are more alkaline than is typical. They are enough like the Osier soils in morphology, composition, and behavior that a new series is not warranted.

[7] The Wahee soils in these counties are taxadjuncts to the Wahee series because they contain less silt than is typical. They are enough like the Wahee soils in morphology, composition, and behavior that a new series is not warranted.

Entisols are young mineral soils that do not have genetic horizons or have only the beginning of such horizons.

Inceptisols are mineral soils in which genetic horizons have definitely started to develop. They generally are on young, but not recent, land surfaces.

Spodosols are mineral soils that have a spodic horizon, which is an underlying layer enriched with illuvial sesquioxides and organic carbon, or that have a thin horizon that is cemented by iron and overlies a fragipan and that meets all requirements of a spodic horizon except thickness.

Alfisols are soils containing a clay-enriched B horizon that has high base saturation.

Ultisols are mineral soils that have distinct horizons and are commonly on old land surfaces. They contain a clay-enriched B horizon that has low base saturation. The base saturation decreases as depth increases.

SUBORDER: Each order is divided into suborders, primarily on the basis of soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders have a narrower climatic range than the orders. The properties used to determine suborders are chiefly those that reflect the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

GREAT GROUP: Each suborder is divided into great groups according to the presence or absence of genetic horizons and the arrangement of these horizons. The horizons considered are those in which clay, iron, or humus has accumulated or those having pans that interfere with the growth of roots or the movement of water. Among the features considered are the self-mulching properties of clay, the soil temperature, and the major differences in chemical composition, mainly calcium, magnesium, sodium, and potassium.

SUBGROUP: Each great group is divided into subgroups. One of these subgroups represents the central (typic) segment of the great group, and the others, called intergrades, contain those soils having properties mostly of the one great group, but also one or more properties of soils in another great group, suborder, or order.

FAMILY: Each subgroup is divided into families, primarily on the basis of properties important to the growth of plants. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, consistence, and thickness of horizons.

SERIES: The series consists of a group of soils that formed from a particular kind of parent material and have genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, structure, reaction, consistence, and mineralogical and chemical composition.

Additional Facts About the Counties

This section describes the climate, geology, and water supply of Bryan and Chatham Counties.

Climate [6]

Bryan and Chatham Counties are on the upper Georgia coast and extend from the Atlantic Ocean to a maximum of about 50 miles inland. The terrain is mostly nearly level, and much of the area near the coast is marshy. The climate is influenced considerably by the coastal location and the subtropical latitude. Table 10 summarizes temperature and precipitation data, and table 11 gives probabilities of the last freezing temperature in spring and the first in fall.

Summers are warm, humid, and long. The highest afternoon temperatures are in the 90's and high 80's most of the time from May through September. Unusually high temperatures are rare because the ocean has a moderating effect. A temperature of 100° F. or higher occurs in only about half the years. In summer the daily rise in temperature is frequently interrupted by an afternoon thundershower. Minimum temperatures in summer are usually in the low 70's but occasionally drop below 70. The relative humidity is moderately high in summer. Averages range from 90 percent, or slightly higher, between 1 and 7 a.m. to about 60 percent between noon and 3 p.m.

Winters are usually mild and short. Many of the cold outbreaks from the north fail to reach the Georgia coast, and those that do move into the area are considerably moderated. Cold spells usually last only 2 or 3 days and alternate with longer periods of mild weather. The ocean exerts an even greater influence on temperatures in winter than in summer. The lowest temperatures average several degrees warmer along the coast than inland. The average number of days that have freezing temperature ranges from less than 20 along the coast to more than 30 in the colder areas inland. The freeze-free growing season averages about 265 days but is longer on the coast and shorter inland. Relative humidity is lower in winter than summer. Hourly averages range from about 85 percent between 5 and 8 a.m. to 55 percent between 2 and 4 p.m.

Temperatures are generally mild in spring and fall. The daily average temperature gradually increases in spring and gradually decreases in fall. Spring has more rain and wind than fall and also more periods of unsettled weather.

The average annual rainfall is between 45 and 50 inches. Almost half the annual total occurs from June through September. Most warm season precipitation occurs in thunderstorms. These storms are most frequent in midsummer when they may be expected on about half of the days. They occur more frequently in the afternoon and usually do not last long. Most precipitation in winter is associated with low pressure centers that move northeastward through or near the survey area. The heaviest rainfall in the area occurs in connection with tropical cyclones. Measurable rainfall occurs on an average of 110 days per year.

Snowfall is rare in coastal Georgia but occasionally occurs. A record fall of 3.6 inches was measured at the Savannah Airport in February 1968. Tornadoes have been reported in the area several times, but no major storm of this type has been recorded. Thunderstorms occur on 65 days during an average year, and some of the more severe storms have damaging winds and hail.

Geology [7]

Bryan and Chatham Counties are in an area that was greatly influenced by the rise and fall of the sea level during the Pleistocene when the glaciers repeatedly advanced and retreated. Although the great ice sheets of the Quaternary age did not reach Georgia, influences of the melted ice sheets are seen today in the series of terraces of the Central Plain, each at a lower elevation seaward. These terraces were deposited or cut when the sea stood at different levels in response to changes in climate. They cannot be dated accurately as yet, but the available evidence indicates these terraces formed during the Pleistocene (*6*).

At least five ancient marine terraces occur in the survey area. Topographic maps indicate the most apparent shorelines were at 150, 100, 70, 30 and 10 feet above sea level. These shorelines are the peaks of marine invasion. A marine terrace represents deposition between two successive shorelines of the sea, one at the base of the terrace and the other at its top.

The oldest terrace deposits are the highest. In order of decreasing altitude above sea level and decreasing age, the deposits are of the Okefenokee, Wicomico, Penholoway, Pamlico, and Silver Bluff Formations (fig. 15).

The Okefenokee Formation, the oldest and highest of the terraces, is represented by an area north and west of Pembroke in Bryan County.

The Wicomico Formation is fairly extensive in the northern and northwestern parts of Bryan County. This formation generally ranges from 70 to 100 feet in elevation. Marine and coastal features, such as offshore bars and lagoons, are fairly well developed in the area south and southeast of Ellabell. The Wicomico shoreline is least sharply defined, which indicates that the sea stood at this level for a comparatively short time.

The Penholoway Formation occurs in the western half of Bryan County at an elevation of 30 to 70 feet. It is most extensive in the vicinity of the Canoochee River, and it gradually narrows in a northerly direction until it fades out just south of Blitchton. At this point the Penholoway shoreline merges with the Pamlico shoreline.

The Pamlico Formation covers most of Chatham County and the southeastern part of Bryan County. This formation consists chiefly of sand and clay. In Chatham County, at Travis Field, on Cherokee Hill, and at Hunter Air Force Base, are remnants of offshore islands and pos-

[6] By HORACE S. CARTER, climatologist for Georgia, National Weather Service, U.S. Department of Commerce.

[7] By ALEXANDER WRIGHT, geologist, Soil Conservation Service.

TABLE 10.—*Temperature and precipitation for Bryan and Chatham Counties, Ga.*

[All data from Savannah Airport]

Month	Temperature [1]				Precipitation [2]		
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average monthly	One year in 10 will have—	
			Maximum temperature equal to or higher than -	Minimum temperature equal to or lower than—		Less than—	More than—
	°F.	°F.	°F.	°F.	Inches	Inches	Inches
January	61. 9	40. 0	77	25	2. 78	0. 6	4. 4
February	61. 1	41. 9	79	28	3. 68	. 6	5. 7
March	69. 7	47. 4	83	32	3. 97	1. 0	9. 5
April	76. 9	54. 4	87	42	3. 70	1. 4	4. 2
May	84. 6	62. 1	93	52	3. 77	. 8	7. 5
June	89. 4	69. 4	98	63	5. 09	2. 3	9. 0
July	90. 4	71. 4	97	67	6. 61	2. 7	13. 1
August	90. 3	71. 4	97	66	6. 62	2. 6	11. 1
September	85. 4	67. 3	93	59	5. 25	1. 3	13. 9
October	78. 6	56. 2	87	42	2. 58	. 4	7. 4
November	69. 3	45. 6	81	31	2. 05	. 4	4. 4
December	62. 0	39. 3	76	25	2. 81	. 6	5. 3
Year	76. 9	55. 5	[3] 100	[4] 21	48. 91	32. 9	64. 2

[1] Period of record 1938–67.
[2] Period of record 1931–60.
[3] On at least 4 days in 2 years out of 10, the temperature is 100° F. or higher.
[4] On at least 4 days in 2 years out of 10, the temperature is 21° F. or lower.

TABLE 11.—*Probabilities of last freezing temperature in spring and first freezing temperature in fall* [1]

Probability	Dates for given probability of a temperature of—		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than	February 20	March 13	March 30
2 years in 10 later than	February 12	March 3	March 22
5 years in 10 later than	January 18	February 8	March 3
Fall:			
1 year in 10 earlier than	November 20	November 16	November 1
2 years in 10 earlier than	December 1	November 22	November 8
5 years in 10 earlier than	December 17	December 2	November 21

[1] Period of record 1935–66.

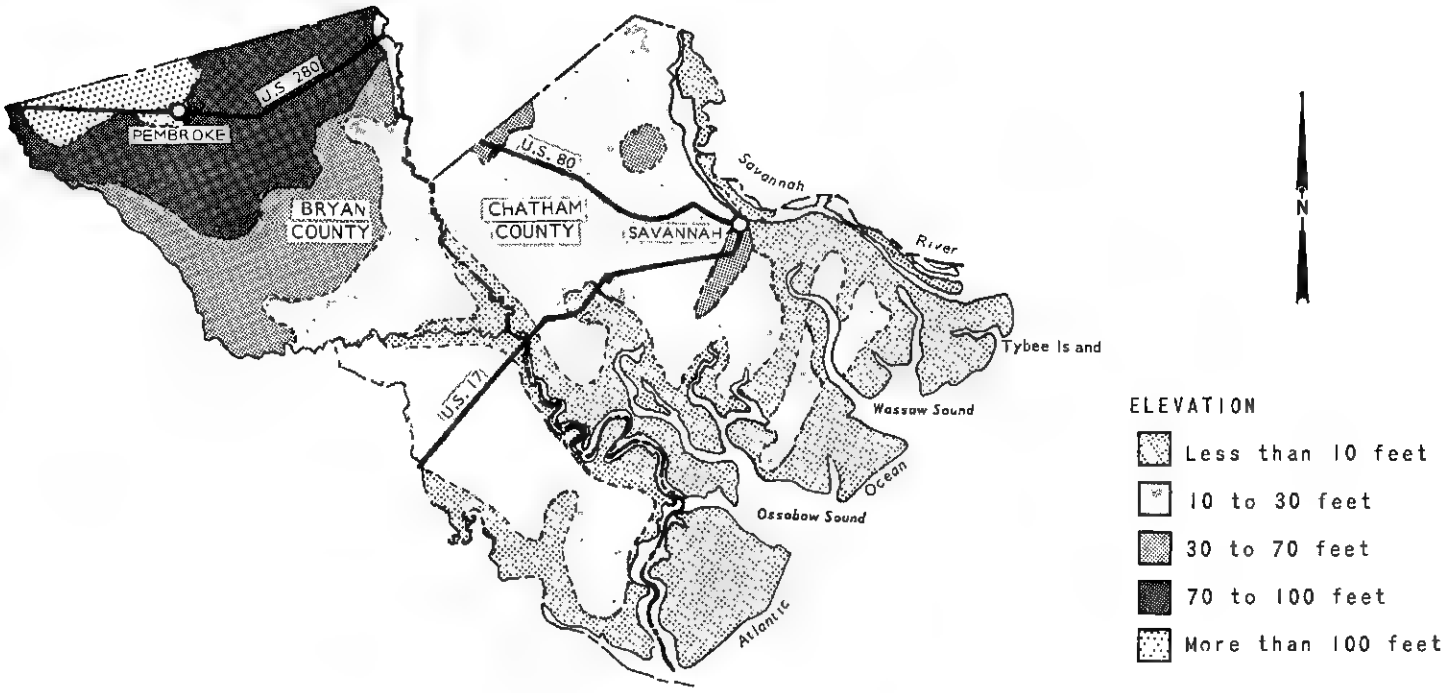

***Figure 15.*—Location of the marine terraces. The Silver Bluff Formation is at elevations of less than 10 feet; the Pamlico Formation is between 10 and 30 feet; the Penholoway Formation is between 30 and 70 feet; the Wicomico Formation is between 70 and 100 feet; and the Okefenokee Formation is at elevations of more than 100 feet.**

sibly barrier beaches of the Pamlico Formation. A large part of the city of Savannah also may be situated on a remnant of an island or barrier beach of the Pamlico Formation. The former salt marshes landward of the Pamlico barrier islands are fairly wide. The elevation of the old marsh ranges from 18 to 25 feet.

The Silver Bluff Formation represents a shoreline 6 to 8 feet above sea level. It includes the intercoastal tidal flats, the salt marsh savannahs, and the offshore barrier islands. Some parts of these barrier islands are fairly recent.

On the northeast and east sides of the major streams, there is generally a sand ridge that probably was deposited by wind.

More recent deposits occur on the flood plains of the major streams. These deposits are of Coastal Plain origin, except along the Savannah River where the sediments are mixed Coastal Plain and Piedmont materials.

Water Supply

The major part of the supply of surface water is contained in the Savannah, Ogeechee, and Canoochee Rivers. The headwaters for the Savannah River originate northwestward in the Appalachian Mountains, and the Ogeechee and Canoochee Rivers originate in the Coastal Plain. Most of the streams that control local drainage have shallow poorly defined channels and stop flowing in the dry periods. The city of Savannah obtains most of its water supply from the Savannah River. Shallow wells supply some water, but the danger of pollution and the availability of a reliable source of underground water have led to increased use of the underground aquifer throughout the two counties.

The underground aquifer that underlies the survey area consists of three limestone formations that act as a single hydrologic group (*4*). Above and below the aquifer are beds of clay that confine the water in the limestone. The upper confining bed is of Miocene age, and the lower is of middle Eocene age. Wells are usually cased in the top part of the limestone, and they extend below the casing. The yield depends on the diameter of the well and ranges from 500 to 2,000 gallons per minute. The top of the aquifer is closer to the surface in the eastern part of Chatham County and dips in a southwest direction. The top is about 150 feet below mean sea level in the eastern part of Chatham County and is about 300 feet below mean sea level along the boundary between Bryan and Liberty Counties.

Literature Cited

(1) Abercrombie, W. F.
1954. A system of soil classification. Highway Res. Bd. Proc. Pub. 324, pp. 509–514, illus.

(2) American Association of State Highway Officials.
1961. Standard specifications for highway materials and methods of sampling and testing. Ed. 8, 2 v., illus.

(3) Baldwin, Mark, Kellogg, Charles E., and Thorp, James
1938. Soil classification. U.S. Dept. Agr. Ybk., pp. 970–1001, illus.

(4) Georgia Department of Mines, Mining and Geology.
1956. Availability and use of water in Georgia. Prepared in cooperation with U.S. Dept. of Int., Geol. Survey Bul. No. 65, 329 pp., illus.

(5) GEORGIA DEPARTMENT OF PUBLIC HEALTH.
1964. RECOMMENDATIONS FOR THE DESIGN, OPERATION, AND MAINTENANCE OF SEWAGE OXIDATION PONDS. 20 pp., illus.
(6) HOYT, JOHN H., and HAILS, JOHN R.
1967. PLEISTOCENE SHORELINE SEDIMENTS IN COASTAL GEORGIA; DEPOSITION AND MODIFICATION. Sci. 155, No. 3769: 1541–1543, illus.
(7) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Sci. 137: 1027–1034, illus.
(8) THORP, JAMES, and SMITH, GUY D.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS. Soil Sci. 67: 117–126.
(9) UNITED STATES DEPARTMENT OF AGRICULTURE.
1951. SOIL SURVEY MANUAL. U.S. Dept. Agr. Handbook No. 18, 503 pp., illus.
(10) ———
1960. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 265 pp., illus. [Supplements issued in March 1967 and September 1968]
(11) UNITED STATES DEPARTMENT OF DEFENSE.
1968. UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS AND FOUNDATIONS. MIL–STD–619B, 30 pp., illus.
(12) UNITED STATES DEPARTMENT OF HEALTH, EDUCATION AND WELFARE.
1957. MANUAL OF SEPTIC-TANK PRACTICES. U.S. Public Health Service Pub. No. 526, 93 pp., illus. (Reprinted 1963)
(13) UNITED STATES DEPARTMENT OF THE INTERIOR.
1966. FEDERAL ASSISTANCE IN OUTDOOR RECREATION. Bureau of Outdoor Recreation. No. 1, 83 pp. (Revised 1966)

Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft. When dry, breaks into powder or individual grains under very slight pressure.

Cemented. -Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, though mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material may be sandy or clayey, and it may be cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other dilutents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates on repeated wetting and drying, or it is the hardened relicts of the soft, red mottles. It is a form of the material that has been called laterite.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips, or bands, to serve as vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plower layer.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

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GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. The suitability of soils for crops and pasture is given in the description of each mapping unit. The capability classification system is described on pages 61 to 63. For information about the suitability of the soils for woodland and wildlife habitat, read the introduction to these sections and refer to the tables in each section. Other information is given in tables as follows:

Acreage and extent, table 1, page 11.
Limitations of the soils in town and country planning, table 2, page 40.
Uses of the soils in engineering, tables 3, 4, and 5, pages 44 through 55.
Estimated yields, table 8, page 64.

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
			Symbol	Symbol
AB	Angelina and Bibb soils, frequently flooded	13	VIIw-1	2w9
As	Albany fine sand	12	IIIw-1	3w2
Cc	Cape Fear soils	14	Vw-1	2w9
Ch	Capers soils	14	VIIw-3	---
Cm	Chipley fine sand	15	IIIs-1	2w2
Cub	Coastal beach	15	VIIIs-1	---
Cuc	Chipley-Urban land complex	15	IIIs-1	---
Cx	Craven loamy fine sand	17	IIw-3	3w2
Da	Dothan loamy sand	18	IIs-1	2o1
El	Ellabelle loamy sand	18	Vw-1	2w9
Fs	Fuguay loamy sand	19	IIs-1	3s2
Fws	Fresh water swamp	19	VIIw-1	---
Je	Johnston loam	21	Vw-2	1w9
Kic	Kershaw-Osier complex	23	VIIs-1	---
KkC	Kershaw coarse sand, 2 to 8 percent slopes	23	VIIs-1	5s3
LMD	Lucy loamy sand, 5 to 12 percent slopes	25	IVs-1	3s2
Lp	Lakeland sand	23	IVs-1	4s2
LQ	Lynn Haven sand	26	IVw-3	4w3
Lr	Leon fine sand	25	IVw-3	4w2
Mae	Made land	26	VIIw-3	---
Mba	Meggett loam	28	Vw-1	1w9
Mn	Mascotte sand	27	IIIw-4	3w2
Oj	Ocilla complex	28	IIIw-1	3w2
Ojc	Ocilla-Urban land complex	28	IIIw-1	---
Ok	Ogeechee loamy fine sand	29	IIIw-5	2w3
Okc	Ogeechee-Urban land complex	29	IIIw-5	---
Ol	Olustee fine sand	31	IIIw-1	3w2
Om	Osier fine sand	31	Vw-3	3w3
Pl	Pelham loamy sand	32	IVw-4	2w3
Pn	Pooler fine sandy loam	32	Vw-1	2w9
Se	Stilson loamy sand	34	IIw-2	3s2
Tmh	Tidal marsh, fresh	35	VIIw-2	---
Tml	Tidal marsh, salty	35	VIIw-3	---
Wac	Wahee-Urban land complex	37	IIIw-2	---
Waf	Wahee sandy loam	36	IIIw-2	2w8

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE,
AGRICULTURAL EXPERIMENT STATIONS

GENERAL SOIL MAP

BRYAN AND CHATHAM COUNTIES, GEORGIA

Scale 1:253,440
1 0 1 2 3 4 Miles

N

SOIL ASSOCIATIONS

AREAS DOMINATED BY SANDY SOILS

1 Kershaw-Osier-Coastal beach association: Coastal beaches and excessively drained and poorly drained soils that are sandy throughout; on narrow ridges, on dunes, and in depressions

2 Lakeland-Chipley association: Excessively drained to moderately well drained soils that are sandy throughout; on broad ridges

3 Chipley-Leon-Ellabelle association: Moderately well drained and poorly drained soils that are sandy throughout, on broad, low ridges; and very poorly drained soils that have loamy underlying layers, in depressions and drainageways

4 Kershaw-Chipley-Ellabelle association: Excessively drained to moderately well drained sandy soils, on ridges; and very poorly drained soils that have loamy underlying layers, in depressions along the Ogeechee and Canoochee Rivers

AREAS DOMINATED BY SEASONALLY WET SOILS THAT HAVE LOAMY UNDERLYING LAYERS

5 Ocilla-Pelham-Albany association: Somewhat poorly drained soils on low ridges; and in depressions, poorly drained soils that have a sandy surface layer and loamy underlying layers

6 Stilson-Fuquay-Pelham association: Well drained to moderately well drained soils on ridges; and in drainageways, poorly drained soils that have a sandy surface layer and loamy underlying layers

7 Stilson-Pelham-Albany association: Moderately well drained to somewhat poorly drained soils on ridges; and in depressions and drainageways, poorly drained soils that have a sandy surface layer and loamy underlying layers

AREAS DOMINATED BY WET SOILS THAT HAVE LOAMY UNDERLYING LAYERS

8 Ellabelle-Pelham association: Very poorly drained and poorly drained soils that have a thick sandy surface layer over loamy underlying layers; on broad flats and in drainageways

9 Ogeechee-Ellabelle association: Somewhat poorly drained and very poorly drained soils that have a sandy surface layer over loamy underlying layers; mainly on broad flats

AREAS DOMINATED BY WET SOILS THAT HAVE CLAYEY UNDERLYING LAYERS

10 Pooler-Cape Fear association: Somewhat poorly drained and very poorly drained soils that have a clayey underlying layer; in low-lying areas and depressions

AREAS DOMINATED BY WET SOILS THAT HAVE LOAMY TO CLAYEY UNDERLYING LAYERS AND ARE FREQUENTLY FLOODED

11 Ellabelle-Cape Fear association: Very poorly drained soils that have loamy and clayey underlying layers; on creek flood plains and in drainageways that are frequently flooded

12 Tidal marsh-Capers association: Very poorly drained tidal marshes and soils that have a clayey underlying layer; along the eastern seaboard

13 Angelina-Bibb-Fresh water swamp association: Very poorly drained and poorly drained soils that are loamy throughout; on stream flood plains

Compiled 1970

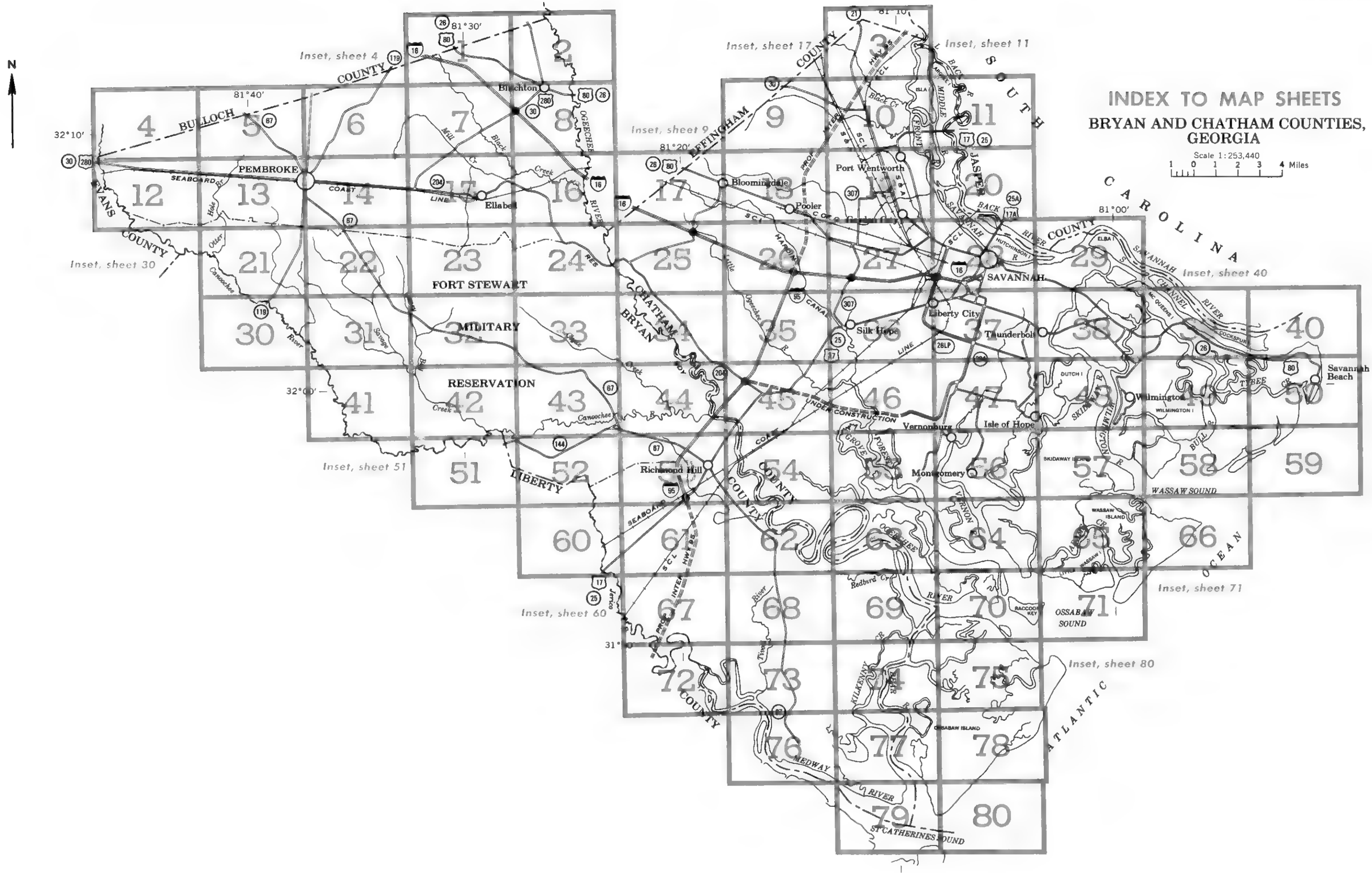
This map is for general planning. It shows only the major soils and does not contain sufficient detail for operational planning.

INDEX TO MAP SHEETS

BRYAN AND CHATHAM COUNTIES, GEORGIA

Scale 1:253,440

1 0 1 2 3 4 Miles



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

BRYAN AND CHATHAM COUNTIES, GEORGIA

UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

SOIL LEGEND

The first letter in each symbol is the initial one of the soil name. If the third letter is a capital it shows the range of slope, from C, 2 to 8 percent slopes, to D, 5 to 12 percent slopes. Symbols without a slope letter are those of nearly level soils.

SYMBOL	NAME
AB	Angelina and Bibb soils, frequently flooded
As	Albany fine sand
Cc	Cape Fear soils
Ch	Capers soils
Cm	Chipley fine sand
Cub	Coastal beach
Cuc	Chipley-Urban land complex
Cx	Craven loamy fine sand
Da	Dothan loamy sand
El	Ellabelle loamy sand
Fs	Fuquay loamy sand
Fws	Fresh water swamp
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Kic	Kershaw-Osier complex
KkC	Kershaw coarse sand, 2 to 8 percent slopes
LMD	Lucy loamy sand, 5 to 12 percent slopes
Lp	Lakeland sand
LQ	Lynn Haven sand
Ls	Leon fine sand
Mae	Made land
Mba	Meggett loam
Mn	Mascotte sand
Oj	Ocilla complex
Ojc	Ocilla-Urban land complex
Ok	Ogeechee loamy fine sand
Okc	Ogeechee-Urban land complex
Ol	Olustee fine sand
Om	Osier fine sand
Pl	Pelham loamy sand
Pn	Pooler fine sandy loam
Se	Stilson loamy sand
Tmh	Tidal marsh, fresh
Tml	Tidal marsh, salty
Wac	Wahee-Urban land complex
Waf	Wahee sandy loam

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Divided
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Buildings
- School
- Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Fort

Located object

BOUNDARIES

- National or state
- County
- Limit of soil survey
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Drainage end or alluvial fan

RELIEF

Escarpments
- Bedrock
- Other

Short steep slope

Prominent peak

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness
  - Stony
  - Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land (M.L)
- Severely eroded spot
- Blowout, wind erosion
- Gully
- Borrow pit (B.P.)

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 1

695 000 FEET

B15 000 FEET

BULLOCH COUNTY

Black Creek

Georges Branch

BORROW PIT

BORROW PIT

(Joins inset, sheet 4)

(Joins sheet 7)

715 000 FEET

805 000 FEET

(Joins sheet 2)

N

1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

(2)

N

740 000 FEET

815 000 FEET

805 000 FEET

720 000 FEET

BULLOCH COUNTY

EFFINGHAM COUNTY

OGEECHEE RIVER

Branch

BORROW PIT

Se Elderd

(Joins sheet 1)

(Joins sheet 8)

1 Mile

5 000 Feet

Scale 1:20 000

Photobase from 1970 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

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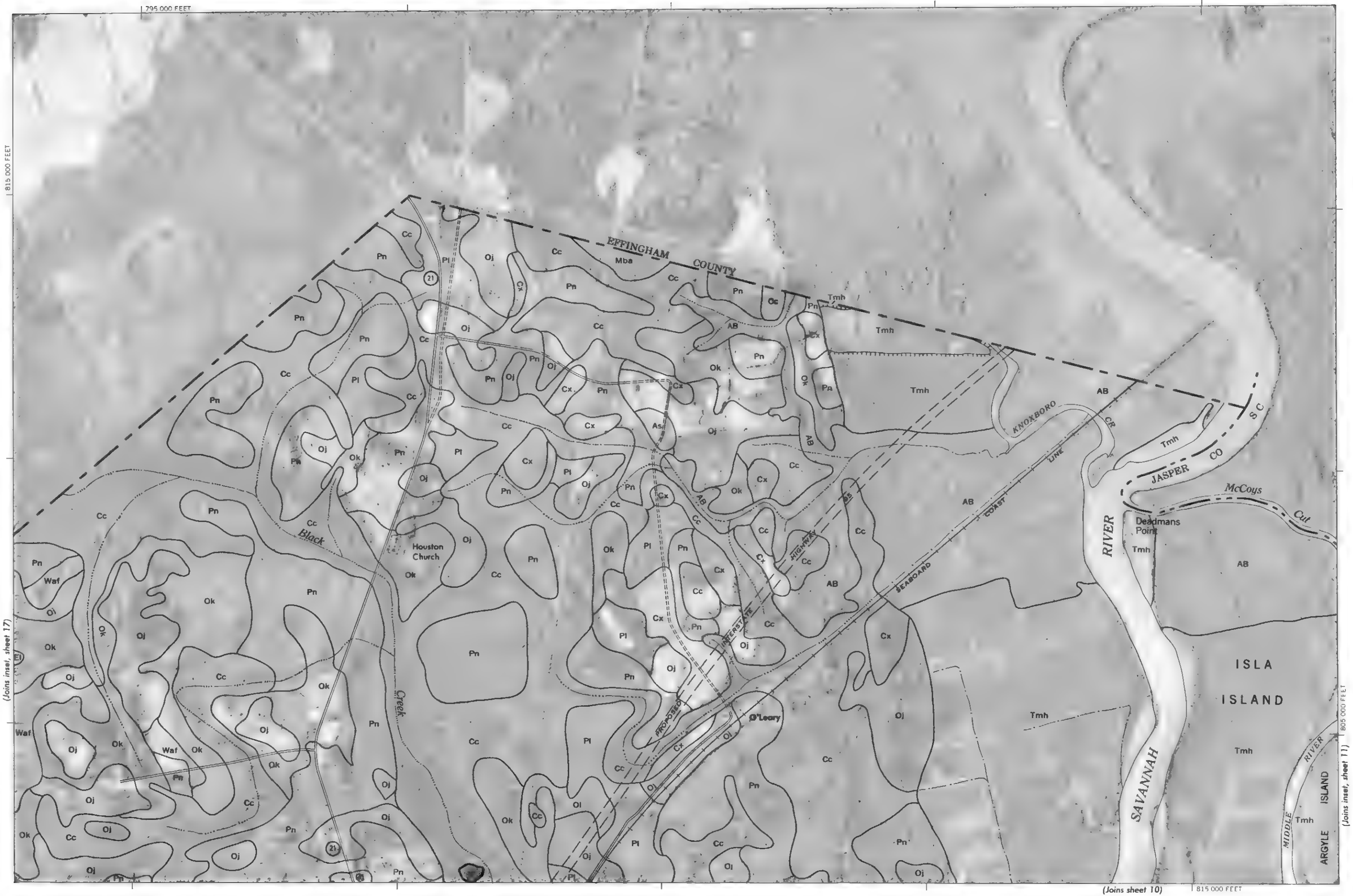
BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 3



3

N

1 Mile

5 000 Feet

Scale 1:20 000

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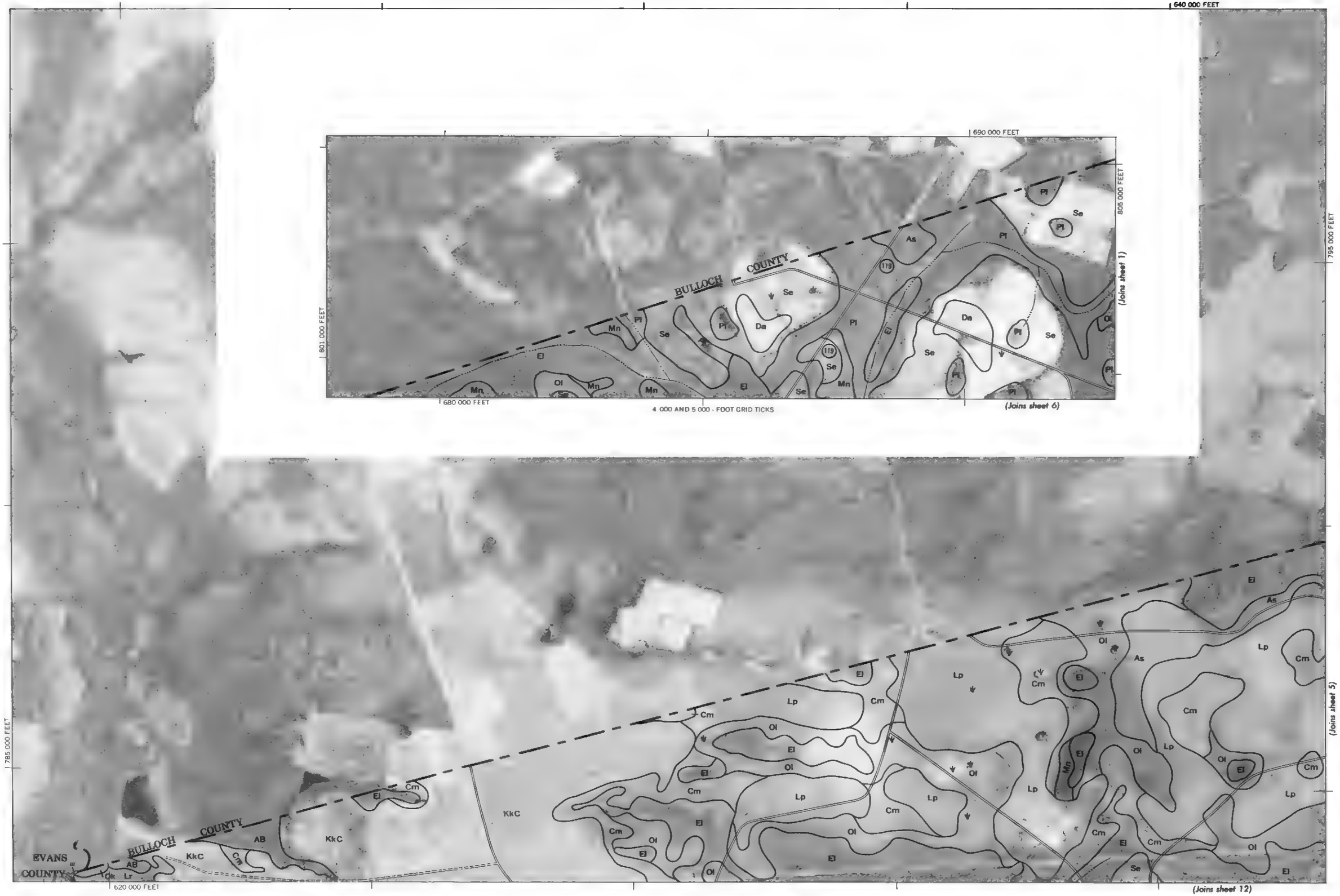
BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 4



N

1 Mile
5 000 Feet
Scale 1:20 000
0 0
¼ 1 000
½ 2 000
¾ 4 000
1 5 000

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

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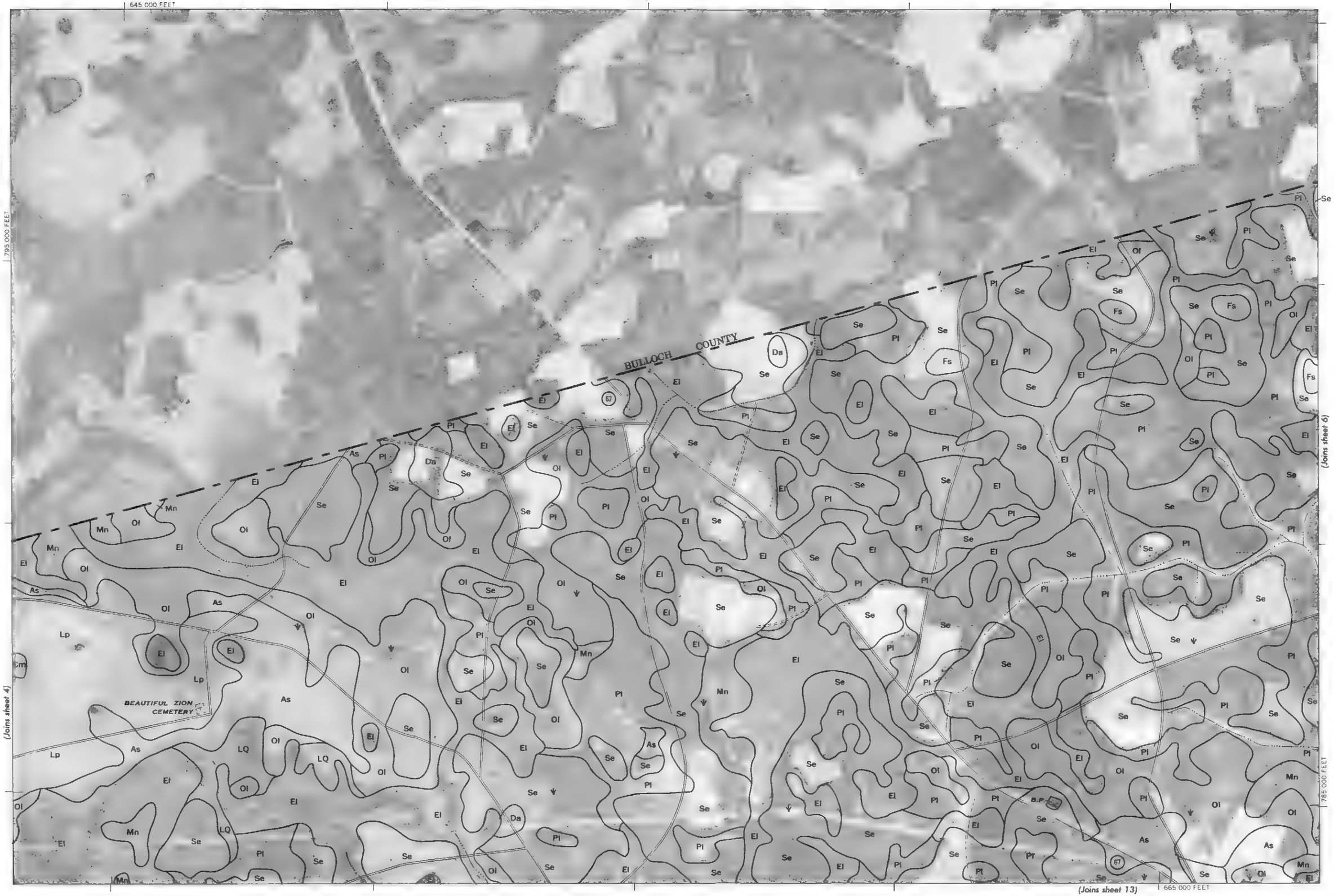
BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 5



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(6)

N

Scale 1:20 000

1 Mile

5 000 Feet

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

(Joins sheet 5)

785 000 FEET

670 000 FEET

(Joins inset, sheet 4)

690 000 FEET

800 000 FEET

(Joins sheet 7)

(Joins sheet 14)

BULLOCH COUNTY

Mill Creek Bay

Patrick Bay

STEVENS GROVE CEMETERY

Mill Creek

Pl Se El Mn Ol Fs Lp As Da Je AB

B.P.

119

Photobase from 1970 aerial photography. Positions of 5 000-foot grid ticks are approximate and based on the Georgia coordinate system east zone

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BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 7

695 000 FEET

800 000 FEET

(Joins sheet 1)

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 15)

715 000 FEET

785 000 FEET

7

N

Scale 1:20 000

1 Mile

5 000 Feet

Olive Branch Church

Lower Black Creek Church

Black Creek School

Black Creek Church

Mill Creek Church

Georges Branch

Black Creek

Mill Creek

BORROW PIT

water

int

B.P.

AB

As

Cm

Da

Di

El

Fs

Je

Lp

Lr

Mn

Ok

Ol

Pl

Se

LMD

K4C

16

30

280

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8

N

(Joins sheet 2)

740 000 FEET

800 000 FEET

Blitchton

Miles Branch

OGEECHEE RIVER

EFFINGHAM COUNTY

water

BORROW PIT

LMD

B.P.

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 7)

785 000 FEET

720 000 FEET

(Joins sheet 16)

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

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BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 9

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770 000 FEET

800 000 FEET

(Joins inset, sheet 17)

765 000 FEET

788 000 FEET

785 000 FEET

767 000 FEET

(Joins lower left)

(Joins sheet 17)

2 000 AND 3 000 FOOT GRID TICKS

EFFINGHAM COUNTY

WALTHOUR

St Augustine Creek

SWAMP

Little Hearts Branch

North Salem Church

CREEK SIDE ROAD

AUGUSTINE CREEK

GODLEY ROAD

PUMPKIN EARTHS ROAD

PROPOSED INT. HWY 95

Walthour Swamp

(Joins inset)

(Joins sheet 10)

(Joins sheet 18)

790 000 FEET

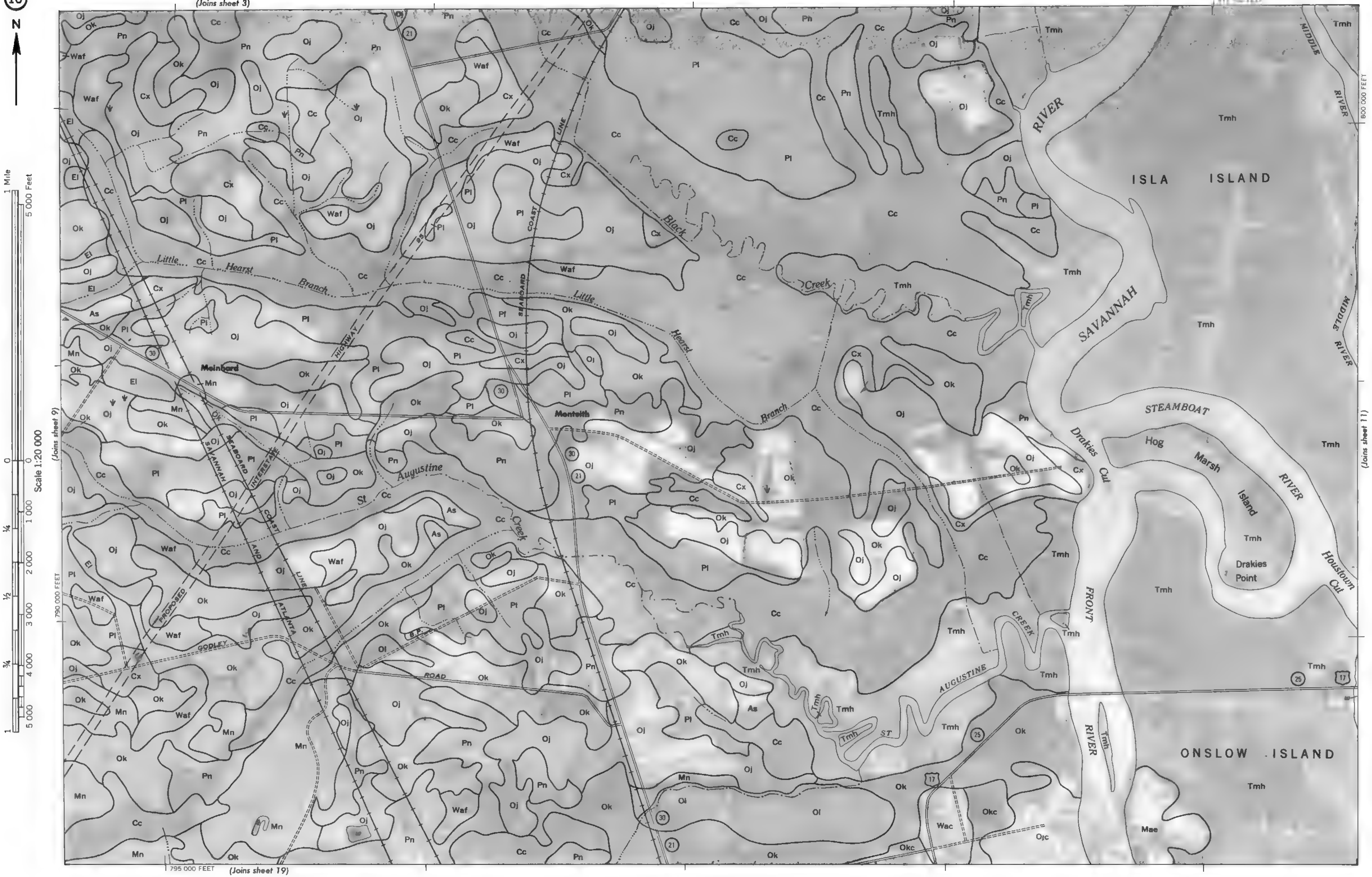
N

1 Mile

5 000 Feet

Scale 1:20 000

1 000 0 1 000 2 000 3 000 4 000 5 000



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(11)

N

820 000 FEET

800 000 FEET

(Joins inset)

(Joins sheet 10)

(Joins sheet 20)

840 000 FEET

790 000 FEET

818 000 FEET

808 000 FEET

803 000 FEET

823 000 FEET

(Joins sheet 3)

(Joins upper left)

ARGYLE ISLAND

ARGLYE ISLAND

JASPER COUNTY

SOUTH CAROLINA

RIVER

MIDDLE RIVER

LITTLE BACK RIVER

ISLAND

ONSLOW ISLAND

AB

Tmh

25

17

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

N

(Joins sheet 4)

640 000 FEET

780 000 FEET

Groveland

Jerusalem Church

SEABOARD COAST LINE

B.P.

Billie Pond

CANOOCHEE RIVER

EVANS COUNTY

FORT STEWART MILITARY RESERVATION

770 000 FEET

620 000 FEET

(Joins sheet 13)

(Joins inset, sheet 30)

Scale 1:20 000

1 Mile

5 000 Feet

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approx mate and based on the Georgia coord nate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 13

13

N

645 000 FEET

780 000 FEET

(Joins sheet 5)

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 21)

665 000 FEET

770 000 FEET

Beautiful Zion Church

Southward

Reka

SEABOARD COAST LINE

Pembroke (county seat)

Pembroke Church

Pembroke High School

St John Church

Moriah Church

Otter Hole Branch

FORT STEWART MILITARY RESERVATION

1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture, Agricultural Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

(14)

N

(Joins sheet 6)

690 000 FEET

780 000 FEET

770 000 FEET

670 000 FEET

(Joins sheet 13)

(Joins sheet 15)

(Joins sheet 22)

1 Mile

5 000 Feet

Scale 1:20 000

0 0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

Bryan County High School

Pembroke Church

Pembroke
(county seat)

TV Tower

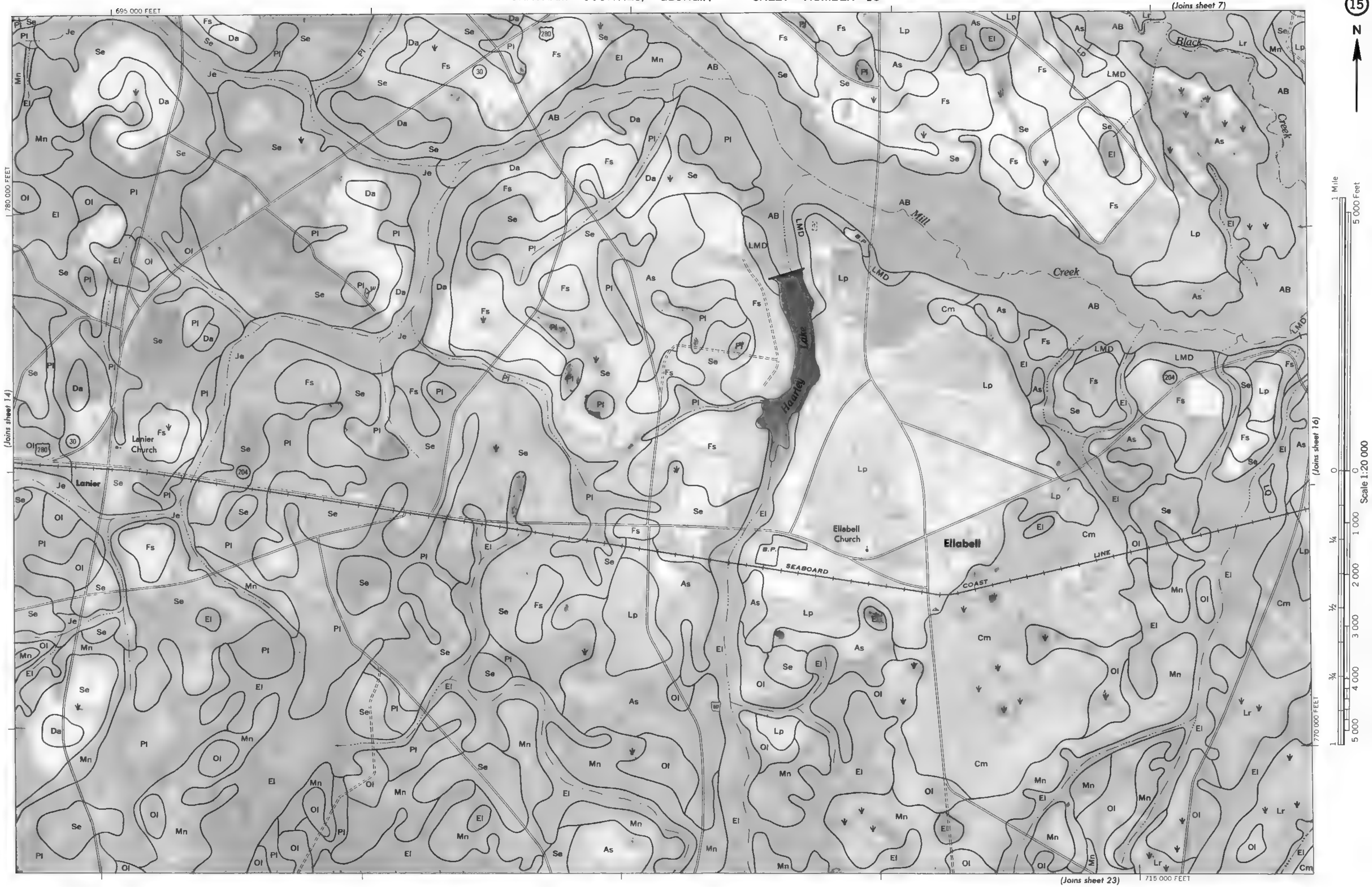
Beulah Church

SEABOARD COAST LINE

Boggy Pond

Photobase from 1971 aerial photography. Projection is Georgia coordinate system, east zone.
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 15



This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

N

(Joins sheet 8)

740 000 FEET

780 000 FEET

770 000 FEET

720 000 FEET

(Joins sheet 24)

(Joins sheet 15)

1 Mile

5 000 Feet

Scale 1:20 000

0 0

¼ 1 000

½ 2 000

¾ 4 000

1 5 000

Macedonia Church

SEABOARD

COAST LINE

BLACK Creek

Little Creek

LMD

BORROW PIT

BORROW PIT

OGEECHEE RIVER

EFFINGHAM COUNTY

water

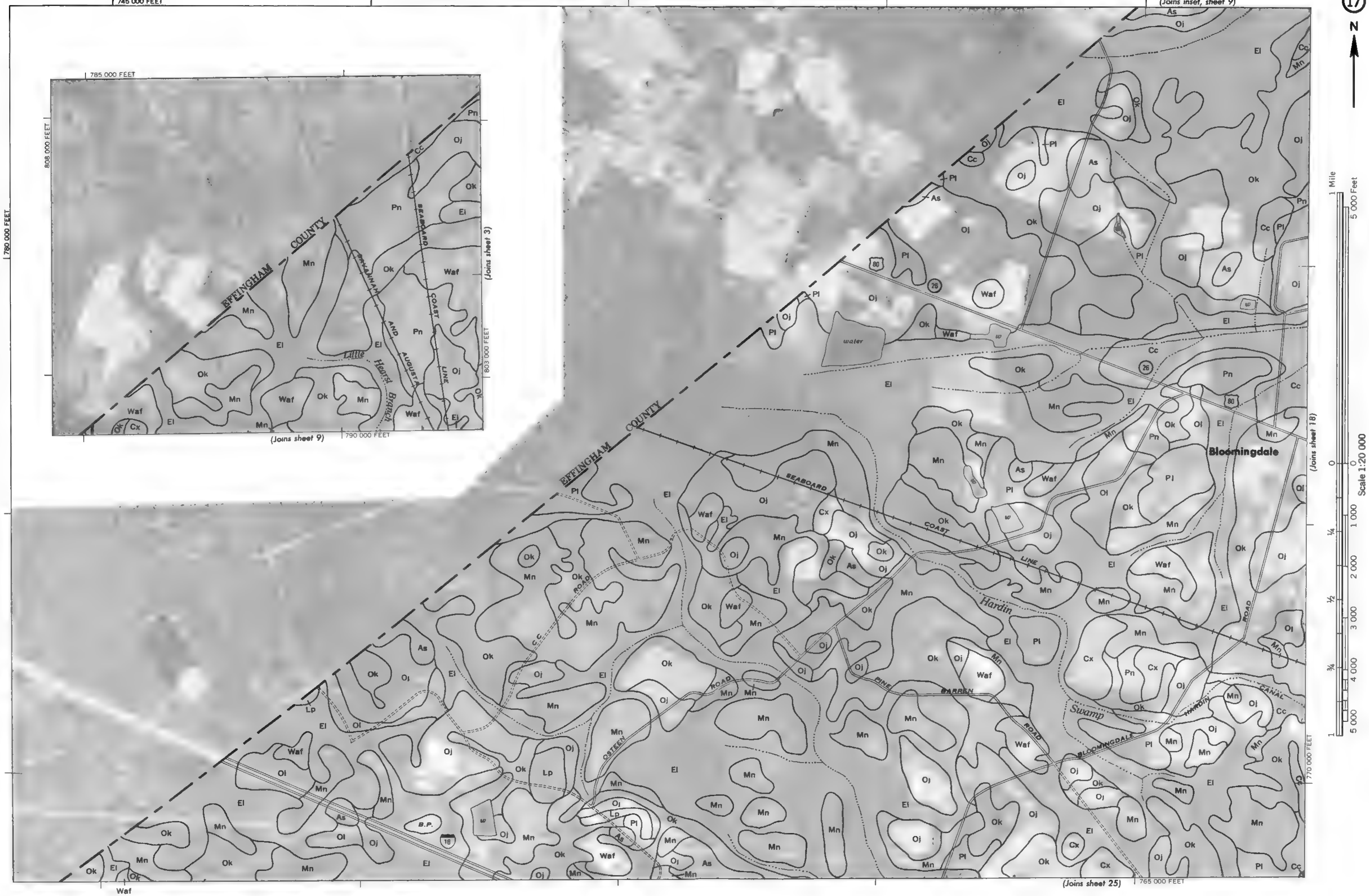
204

16

Se Lp El Cm Fs Da Ok Waf Cx Pl Oj Je As Mn Lr LQ AB

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations



This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

(Joins sheet 9)

790 000 FEET

785 000 FEET

(Joins sheet 17)

(Joins sheet 19)

770 000 FEET

(Joins sheet 26)

Scale 1:20 000

1 Mile

5 000 Feet

0 0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

Swamp

Walthour Swamp

Hardin Swamp

Bloomingdale

Pooler

Pooler School

GRAVEL HILL CEMETERY

B.P

PIPE MAKERS ROAD

OLD CANAL

PROPOSED INTERSTATE HIGHWAY 95

SEABOARD COAST LINE

CENTRAL OF GEORGIA

HARDIN CANAL

BORROW PIT

Waf Oj Ok El Mn Pn Cc Cx Pl Ol As Mba Okc

Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

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Photobase from 1970 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 20

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 21

21

N

645 000 FEET

765 000 FEET

(Joins sheet 13)

(Joins inset, sheet 30)

(Joins sheet 22)

(Joins sheet 30)

665 000 FEET

FORT STEWART MILITARY RESERVATION

Hole Branch

Otter

LIBERTY COUNTY

CANOOCHEE RIVER

Simmons Point

BORROW PIT

B.P.

Scale 1:20 000

1 Mile

5 000 Feet

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 22

22

N

(Joins sheet 14)

690 000 FEET

1 765 000 FEET

Boggy Pond

Cypress Bay

Caney Bay

F O R T S T E W A R T M I L I T A R Y R E S E R V A T I O N

Savage Creek

(Joins sheet 21)

(Joins sheet 23)

755 000 FEET

670 000 FEET

(Joins sheet 31)

Scale 1:20 000

1 Mile

5 000 Feet

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 23

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

695 000 FEET

765 000 FEET

(Joins sheet 15)

(Joins sheet 22)

(Joins sheet 24)

755 000 FEET

(Joins sheet 32)

715 000 FEET

Bay

Cross

Cypress

Bay

F O R T S T E W A R T M I L I T A R Y R E S E R V A T I O N

Se Pl Mn El Ol Fs As Cm Lr Lg Mg

N

Scale 1:20 000

1 Mile

5 000 Feet

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 24

(24)

N

Scale 1:20 000

1 Mile

5 000 Feet

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

740 000 FEET

1 765 000 FEET

1 750 000 FEET

1 720 000 FEET

(Joins sheet 16)

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 33)

EFFINGHAM COUNTY

BRYAN COUNTY

CHATHAM COUNTY

OGEECHEE RIVER

OGEECHEE RIVER

FORT STEWART MILITARY RESERVATION

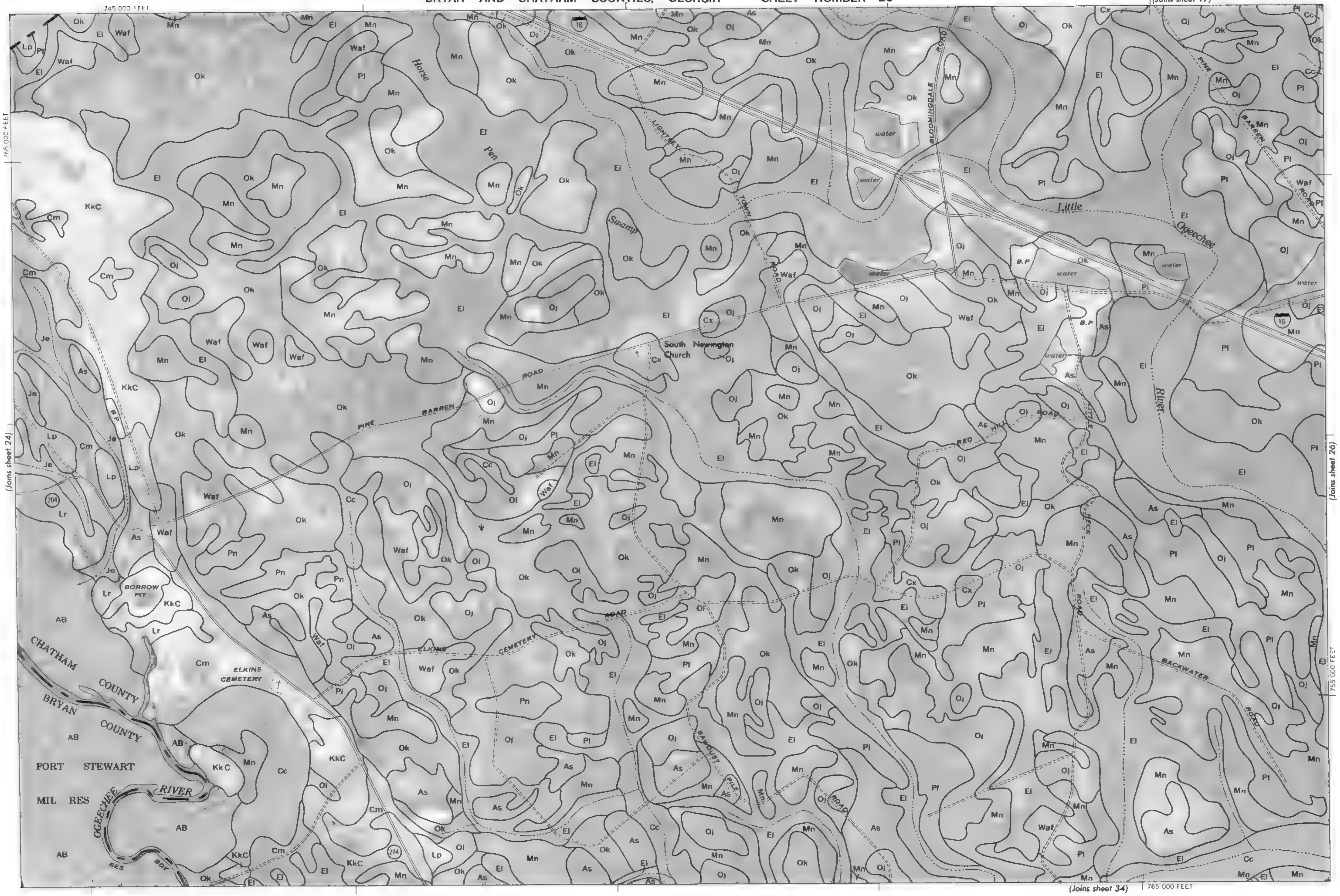
LIBERTY HILL CEMETERY

LMD

204

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations



25

N

Scale 1:20 000

1 Mile, ¾, ½, ¼, 0

5 000 Feet, 4 000, 3 000, 2 000, 1 000, 0

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.

N

(Joins sheet 18)

790 000 FEET

765 000 FEET

755 000 FEET

770 000 FEET

(Joins sheet 25)

(Joins sheet 27)

(Joins sheet 35)

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

Photobase from 1970 aerial photography. Positions of 5 000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agriculture Experiment Stations

SEABOARD COAST LINE

CENTRAL OF GEORGIA

HIGHWAY 80

PINE BARREN ROAD

HARDIN ROAD

INTERSTATE 95

CANAL

BORROW PIT

PROPOSED

Little Ogeechee River

Hardin Swamp

water

B.P.

N

795 000 FEET

765 000 FEET

(Joins sheet 19)

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 36)

815 000 FEET

755 000 FEET

SAVANNAH
(county seat)

Groves High School

Woodlawn Church

Dean Forest Church

PIPE MAKERS CANAL

CENTRAL OF GEORGIA

SAVANNAH AND ATLANTA

S C L SEABOARD COAST LINE

BORROW PIT

DEAN FOREST ROAD

B.P.

water

Waf 307 Ok Cc Pn Oj Okc Wac Ojc Cuc Cx As Ol El Pl Mba Mn

1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

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Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

845 000 FEET

765 000 FEET

29

N

1 Mile

5 000 Feet

Scale 1:20 000

0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

SOUTH CAROLINA RIVER

JASPER COUNTY

SAVANNAH

BACK RIVER

Mackey Point

Fort Jackson

Creek

Habersham

WILMINGTON RIVER

SOUTH CHANNEL

ST AUGUSTINE CREEK

Elba Island Cut

ELBA ISLAND

OATLAND ISLAND

McQUEENS ISLAND

Fig Island

SOILS NOT SURVEYED

Mae Tmh Tml Cuc Lp El Ch Cm Gm Lr Mn

(Joins sheet 28)

(Joins sheet 38)

(Joins inset, sheet 40)

755 000 FEET

865 000 FEET

N

1 Mile
5 000 Feet
0
0
Scale 1:20 000
1
5 000
¾
4 000
½
3 000
¼
2 000
0
1 000

(Joins sheet 21)

665 000 FEET

735 000 FEET

CANOOCHEE RIVER

Clifton Bluff

FORT STEWART MILITARY RESERVATION

LIBERTY COUNTY

(Joins sheet 31)

(Joins sheet 12)

640 000 FEET

760 000 FEET

EVANS COUNTY

LIBERTY COUNTY

(Joins sheet 21)

630 000 FEET

645 000 FEET

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

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Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

(Joins sheet 22)
(Joins sheet 30)
(Joins sheet 32)
(Joins sheet 41)

670 000 FEET
690 000 FEET
750 000 FEET
735 000 FEET

FORT STEWART MILITARY RESERVATION

LITTLE CREEK CEMETERY

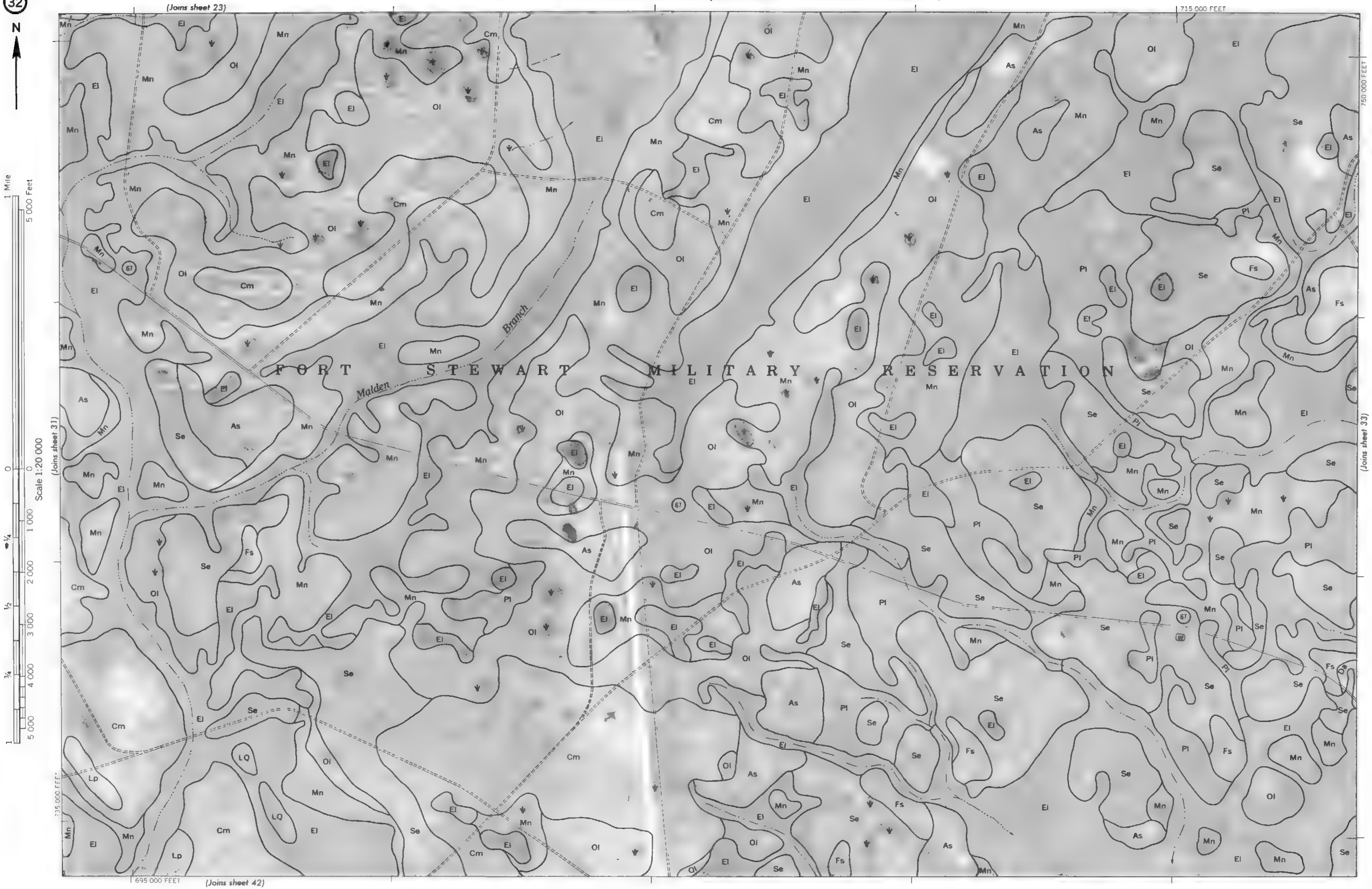
Savage Creek
Bonnett Bay
Boggy Head Bay
Savage Creek
Alligator Bay
Canoochee
Liberty County
River
AB Creek

Lr Cm Lp El Se Mn Pl Ol KkC AB As LQ

31
N

1 Mile
5 000 Feet
Scale 1:20 000

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 32



Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

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Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

720 000 FEET

750 000 FEET

(Joins sheet 24)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 43)

735 000 FEET

740 000 FEET

FORT STEWART MILITARY RESERVATION

Clyde Creek

LMD

AB

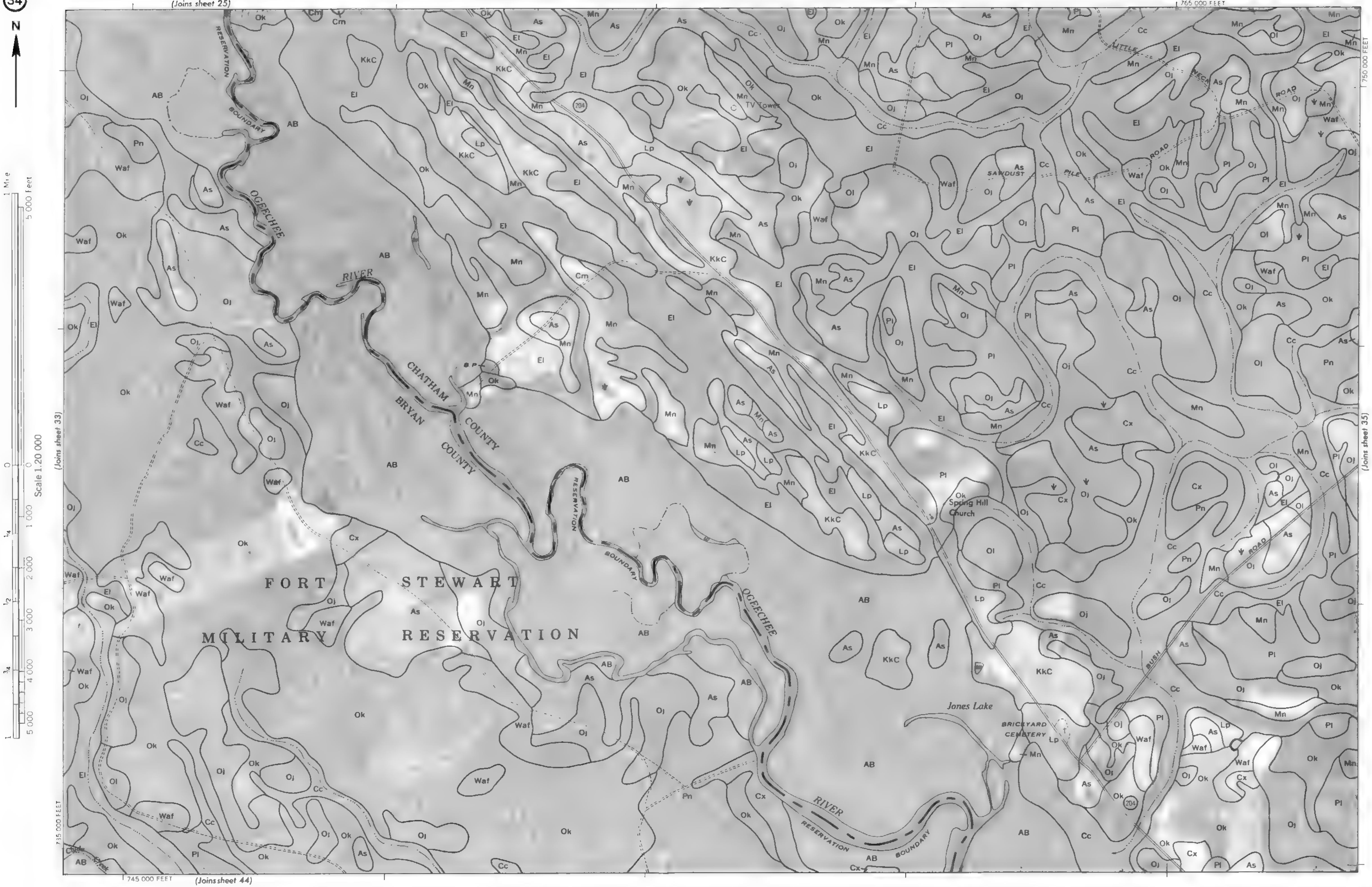
33

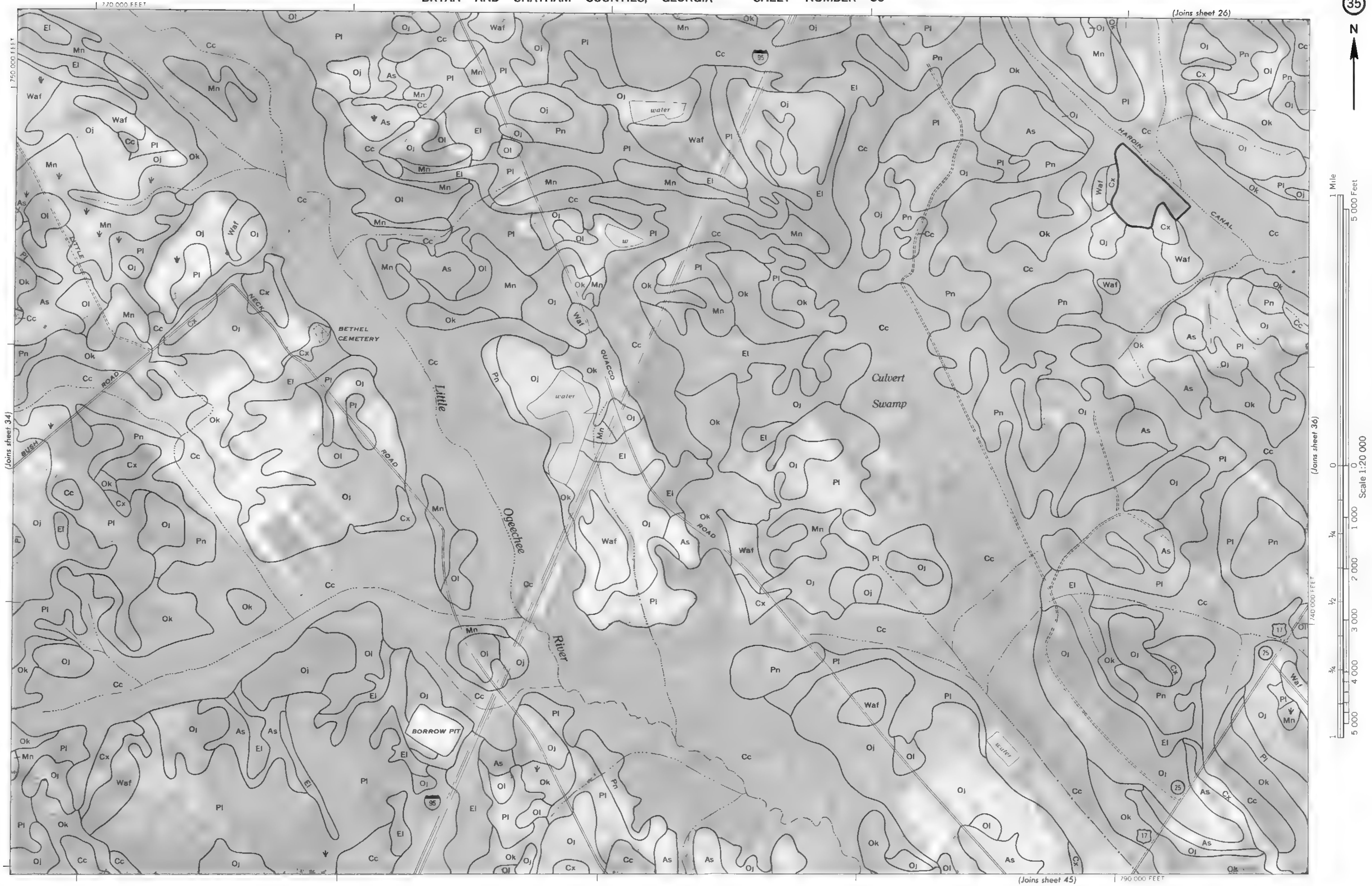
N

1 Mile

5 000 Feet

Scale 1:20 000


N
(Joins sheet 25)
(Joins sheet 33)
(Joins sheet 35)
(Joins sheet 44)
765 000 FEET
750 000 FEET
745 000 FEET
735 000 FEET
Scale 1:20 000
1 Mile
5 000 Feet
OGEECHEE RIVER
RESERVATION BOUNDARY
CHATHAM COUNTY
BRYAN COUNTY
FORT STEWART MILITARY RESERVATION
TV Tower
SAWDUST PILE ROAD
LITTLE NECK ROAD
BUSH ROAD
Spring Hill Church
Jones Lake
BRICKYARD CEMETERY



This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture, Agricultural Experiment Stations.
Photobase from 1970 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

36

N

(Joins sheet 27)

815 000 FEET

750 000 FEET

740 000 FEET

795 000 FEET

(Joins sheet 35)

(Joins sheet 37)

(Joins sheet 46)

1 Mile

5 000 Feet

Scale 1:20 000

1 0 1 0 ¼ 0 ½ ¾ 1

5 000 4 000 3 000 2 000 1 000 0

Silk Hope

Gould School

Oakland Church

Liberty City

Lamarville

HUNTER AIR FORCE BASE

ROAD

FOREST

DEAN

HARDIN

CANAL

SALT CREEK

BORROW PIT

SEABOARD COAST LINE

GARRARD AVENUE

SCL

Photobase from 1970 aer al photography. Positions of 5 000-foot grid ticks are approx mate and based on the Georg a coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

820 000 FEET

750 000 FEET

840 000 FEET

(Joins sheet 36)
(Joins sheet 28)
(Joins sheet 38)
(Joins sheet 47)

37

N

SAVANNAH
(county seat)

SOILS NOT SURVEYED

HUNTER AIR FORCE BASE

Tremont Park
Ogeechee
Liberty City
Richfield
Staley Heights
Sunset Park
Fernwood
Parkwood

LAUREL GROVE CEMETERY
LINCOLN MEMORIAL CEMETERY

SEABOARD COAST LINE
CASEY CANAL
ABERCORN EXTENSION
WHITE BLUFF ROAD
SKIDAWAY ROAD

Okc Ojc Oj Cc Pl Cuc Wac As Ok El Cm Lr Lp Tml

1 Mile
5 000 Feet
Scale 1:20 000
1 5 000
¾ 4 000
½ 3 000
¼ 2 000
0 1 000
0

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 39

39

N

870 000 FEET

(Joins inset, sheet 40)

750 000 FEET

(Joins sheet 38)

740 000 FEET

(Joins sheet 40)

890 000 FEET

(Joins sheet 49)

Bird Island

Mae

Tml

LONG ISLAND

JASPER COUNTY

SAVANNAH

SOUTH CAROLINA

RIVER

CHANNEL

McQUEENS

AUGUSTINE CREEK

water

TURNERS CREEK

Screvens Point

LD

Talahi Island

Cm

Lp

BULL RIVER

SOUTH ISLAND

Cockspur Island

WILMINGTON ISLAND

El

Pl

Lr

OYSTER CREEK

BATES CREEK

BORROW PIT

B.P.

Ol

80

26

1 Mile

5 000 Feet

Scale 1:20 000

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

915 000 FEET

875 000 FEET

758 000 FEET

750 000 FEET

753 000 FEET

740 000 FEET

895 000 FEET

870 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

JASPER COUNTY SAVANNAH SOUTH CAROLINA RIVER

OCEAN

ATLANTIC

Mae

Elba Island Cut

(Joins sheet 29)

SOUTH CHANNEL

Elba Tml

Mae Island

Tml

(Joins sheet 39)

Tml

Fort Pulaski National Monument

Nae

Cockspur Island

Tml

Tml

Tml

(Joins sheet 39)

(Joins sheet 50)

Tml

Mae

Tml

Kuc

Om

Kic

Cub

Kic

Fort Screven

Cuc

Tybee Island

Cm

Ch

Cuc

Om

Ch

26

80

Tml

Om

Cuc

Om

Kic

Om

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coord nate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 41

41

N

670 000 FEET

730 000 FEET

(Joins sheet 31)

(Joins sheet 42)

(Joins inset, sheet 51)

720 000 FEET

690 000 FEET

FORT STEWART MILITARY RESERVATION

CANOOCHEE RIVER

LIBERTY COUNTY

Alligator Bay

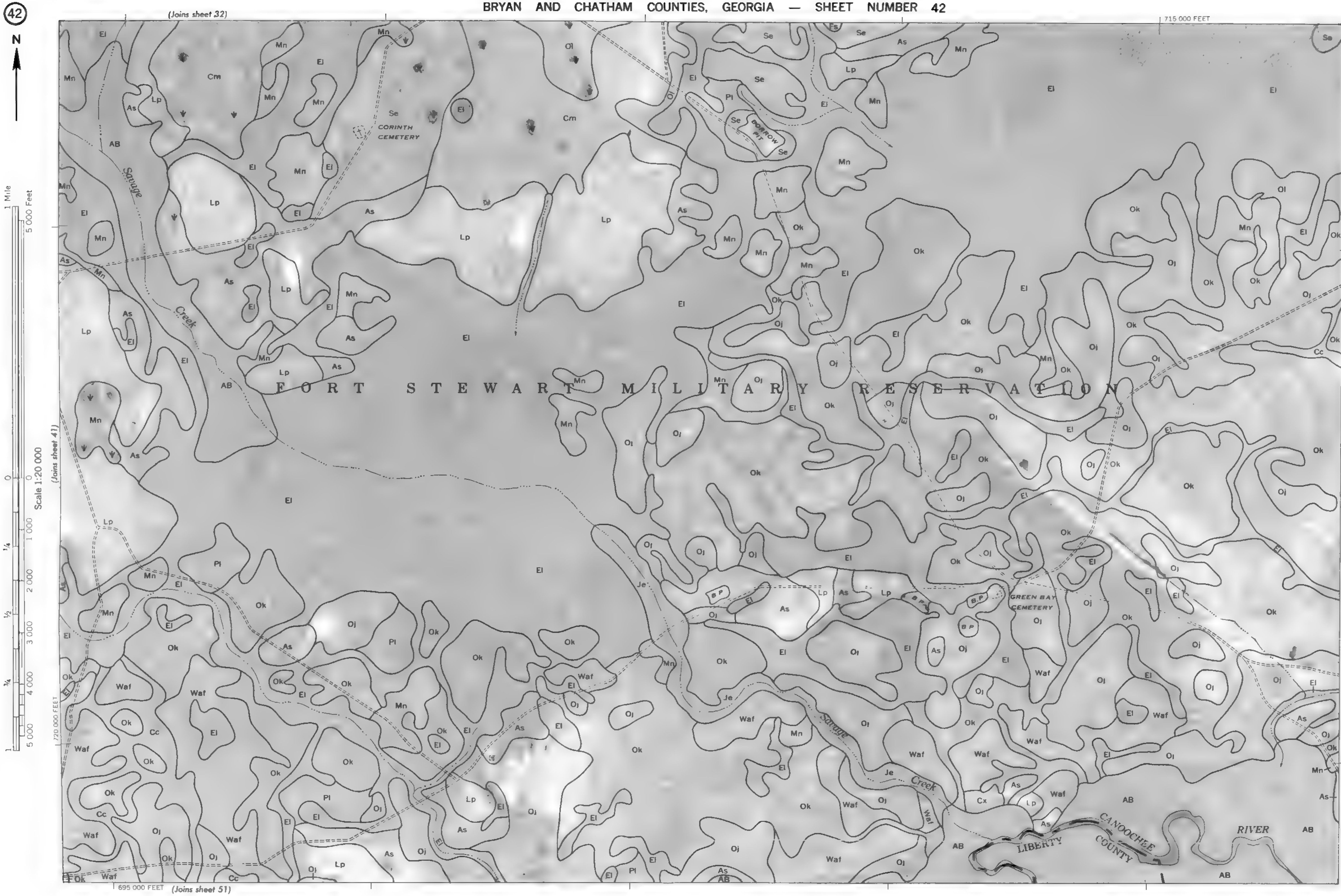
Jones Bay

Savage Creek

AB
As
Cc
Cm
El
Lp
Lr
Mn
Oj
Ok
Ol
Pl
Pn
Se
Waf
KkC

1 Mile
5 000 Feet
Scale 1:20 000
0
1/4
1/2
3/4
1
5 000
4 000
3 000
2 000
1 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations.
Photobase from 1970 aer al photography Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone



Photobase from 197_ aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture Agricultural Experiment Stations.

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 43

43

N

720 000 FEET

730 000 FEET

740 000 FEET

(Joins sheet 33)

(Joins sheet 42)

(Joins sheet 44)

(Joins sheet 52)

FORT STEWART MILITARY RESERVATION

CANOOCHEE RIVER

WISE CEMETERY

BORROW PIT

LMD

B.P.

Lp

1 Mile

5 000 Feet

Scale 1:20 000

1 0 1 2 3 4 5 000

¾ ½ ¼ 0 1 000 2 000 3 000 4 000 5 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service, and the University of Georgia College of Agriculture Agricultural Experiment Stations.

Photobase map is 1971 aerial photography. Positions of 5 000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

N

(Joins sheet 34)

765 000 FEET

730 000 FEET

720 000 FEET

745 000 FEET (Joins sheet 53)

(Joins sheet 43)

(Joins sheet 45)

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

FORT STEWART MILITARY RESERVATION

CHATHAM COUNTY

OGEECHEE

BRYAN COUNTY

RESERVATION BOUNDARY

AMMONIA RESERVATION

Clyde

AB Creek

CANOOCHEE RIVER

RIVER

Lost Swamp

BRAGG CEMETERY

B.P.

AB Ok Oj Pn Waf Cc Cx Fws As Lp El Pl KkC

Photobase from 1970 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 45

45

N

770 000 FEET

730 000 FEET

720 000 FEET

790 000 FEET

(Joins sheet 35)

(Joins sheet 44)

(Joins sheet 46)

(Joins sheet 54)

SAND HILL CEMETERY

Mt. Pilgrim Church

UNDER CONSTRUCTION

USDA PLANT INTRODUCTION GARDEN

BORROW PIT

Chevis Oaks Church

Burroughs

OGEECHEE ROAD

LITTLE NECK ROAD

CHEVIS ROAD

GROVE POINT

SEABOARD COAST LINE

OGEECHEE RIVER

CHATHAM COUNTY

BRYAN COUNTY

water

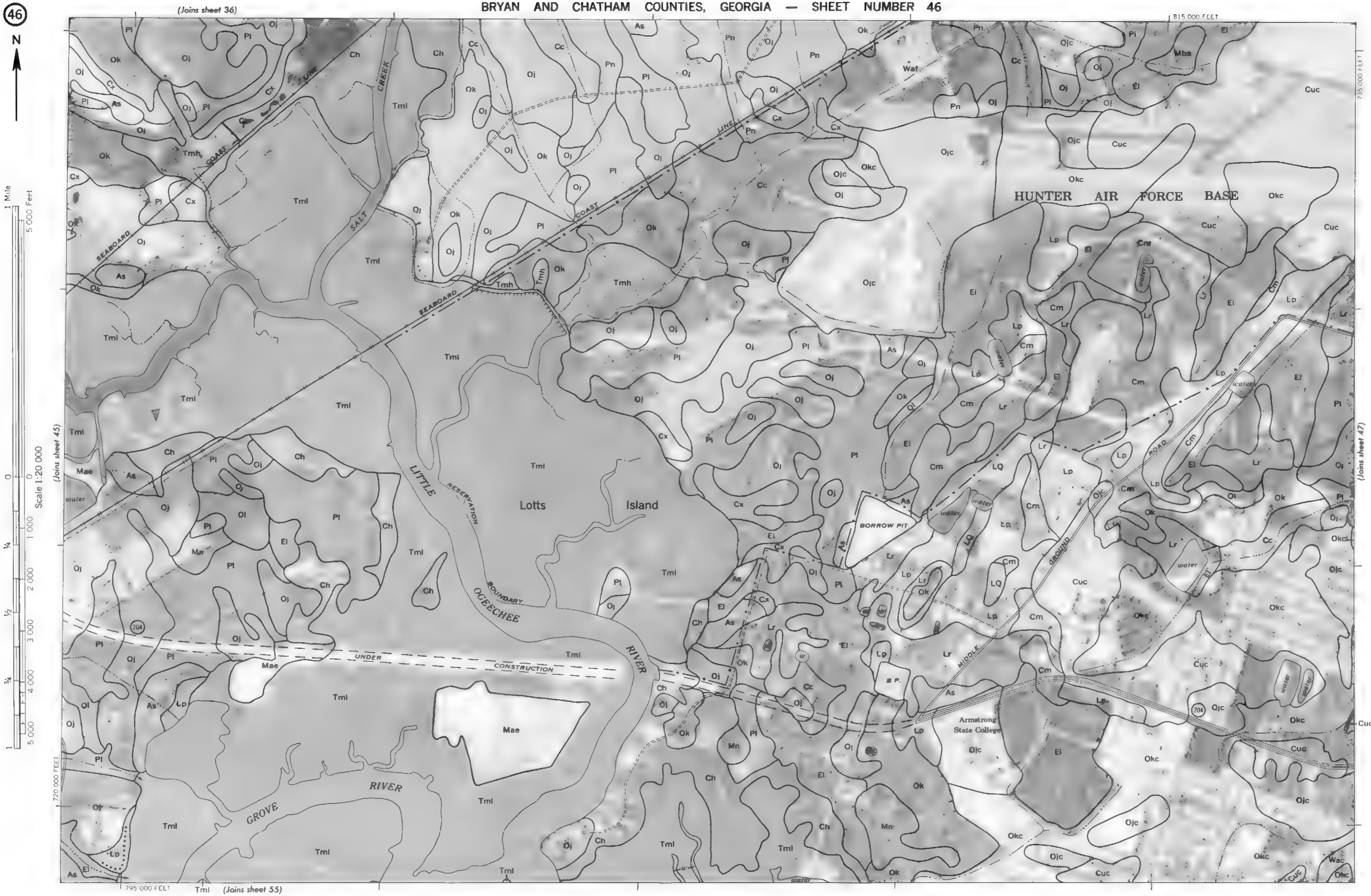
1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture Agricultural Experiment Stations.
Photobase from 1971 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 46



Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agriculture Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000 foot grid lines are approximate and based on the Georgia coordinate system east zone

(Joins sheet 46)
(Joins sheet 37)
(Joins sheet 48)
(Joins sheet 56)

820 000 FEET
735 000 FEET
720 000 FEET
840 000 FEET

47
N

1 Mile
5 000 Feet
Scale 1:20 000
0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

HUNTER AIR FORCE BASE
Bona Bella
White Bluff
WINDSOR FOREST
Isle of Hope
Wilmington Island

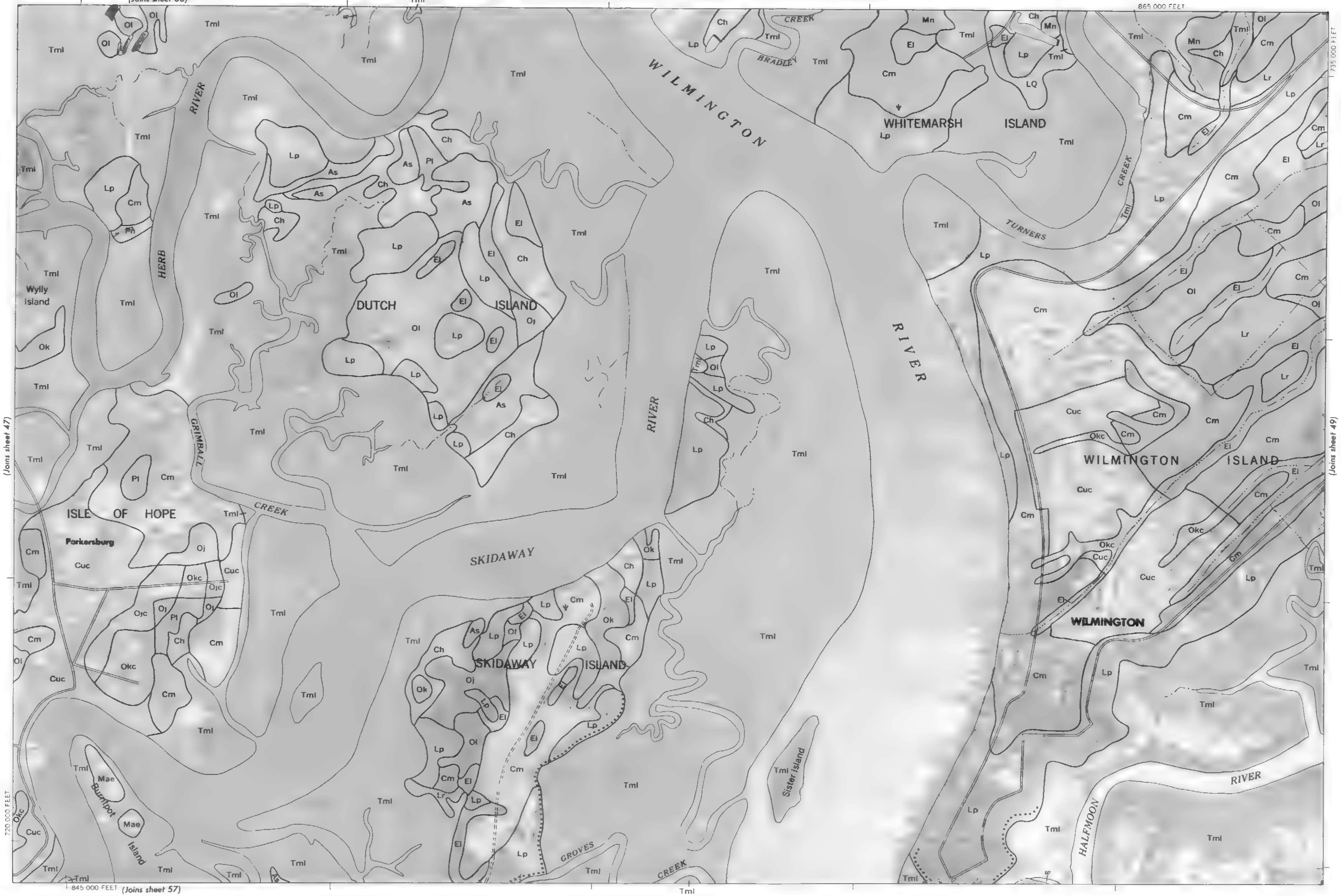
Williamson Creek
RIVER
Harleys Creek
WHITE BLUFF ROAD
MONTGOMERY CROSS ROAD
CANAL ROAD
SKIDAWAY ROAD
CASEY CANAL
BORROW PIT
NEW GUINEA CEMETERY
OLD CHURCH CEMETERY
FERGUSON AVENUE
HERB RIVER
VERNON RIVER
BACK RIVER
ISLE OF HOPE
B.P.
water

Cuc Okc Ojc Oj Pl El Lp Cm As Ok Mn Cc Lq Ch Tml Lr Ol Mba Cx Wac

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 48

N

Scale 1:20 000



Photobase from 1970 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

N

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000 foot grid lines are approximate and based on the Georgia coordinate system, east zone

(Joins sheet 48)

(Joins sheet 39)

(Joins sheet 50)

(Joins sheet 58)

870 000 FEET

735 000 FEET

890 000 FEET

720 000 FEET

BORROW PIT

BATES CREEK

McQUEENS ISLAND

OYSTER CREEK

LAZARETTO CREEK

SHAD RIVER

RIVER

WILMINGTON ISLAND

CREEK

CREEK

TOM BEARD CREEK

HALFMOON RIVER

LONG CREEK

BULL

TYBEE ISLAND

TYBEE CREEK

Cm Ch El Lp Lr Ol Om Tml

1 Mile
5 000 Feet

Scale 1:20 000

(50)

N

(Joins sheet 40)

915 000 FEET

735 000 FEET

(Joins sheet 49)

720 000 FEET

895 000 FEET

(Joins sheet 59)

LAZARETTO CREEK

TYBEE ISLAND

TYBEE

CARTER CREEK

CHIMNEY Creek

Sazarine Creek

HORSEPEN CREEK

CUB CREEK

Savannah Beach

OCEAN

ATLANTIC

Tml Ch Kic Mae Cuc Om

1 Mile 5 000 Feet

Scale 1:20 000

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 51

51

N

695 000 FEET

715 000 FEET

(Joins inset)

(Joins sheet 42)

(Joins sheet 52)

FORT STEWART MILITARY RESERVATION

FSMR

CANOOCHEE RIVER

LIBERTY COUNTY

Waf Oj Ok El Pl Cc Lp As AB

685 000 FEET

715 000 FEET

690 000 FEET

712 000 FEET

705 000 FEET

(Joins sheet 41)

(Joins upper left)

3 000 AND 5 000 - FOOT GRID TICKS

1 Mile

5 000 Feet

Scale 1:20 000

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Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

740 000 FEET

(Joins Sheet 43)

715 000 FEET

(Joins sheet 51)

(Joins sheet 53)

705 000 FEET

720 000 FEET

(Joins sheet 60)

CANOOCHEE RIVER

BORROW PIT

F O R T S T E W A R T M I L I T A R Y R E S E R V A T I O N

LIBERTY COUNTY

Mount Hope Creek

1 Mile

5 000 Feet

Scale 1:20 000

0

¼ 1 000

½ 2 000

¾ 4 000

1 5 000

Photobase from 1971 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agriculture Agricultural Experiment Stations

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

N

(Joins sheet 45)

790 000 FEET

715 000 FEET

(Joins sheet 55)

(Joins sheet 53)

705 000 FEET

770 000 FEET

(Joins sheet 62)

1 Mile

5 000 Feet

Scale 1:20 000

OGEECHEE RIVER

CHATHAM COUNTY

BRYAN COUNTY

SEABOARD COAST LINE

SEABOARD COAST LINE

ROAD

WILD HORN

WILD HORN CEMETERY

ROCKFISH CREEK

Ford Island

AB

Fws

Cc

Cx

Pl

Oj

Pn

Ok

As

El

Tmh

Tml

Ch

Ol

Photobase from 1970 aerial photography. Positions of 5 000 foot grid lines are approximate and based on the Georgia coordinate system east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 55

55

N

795 000 FEET

715 000 FEET

815 000 FEET

705 000 FEET

(Joins sheet 54)

(Joins sheet 46)

(Joins sheet 56)

(Joins sheet 63)

STEADMAN ISLAND

MIDDLE FOREST GROVE MARSH

RIVER

ISLAND

CREEK

ROCKFISH

GROVE RIVER

POINT GROVE ROAD

HOOVER CREEK

WHITE BLUFF ROAD

Coffee Bluff

Houston

water

As Ch Cm Cuc Cx El Lp Mae Mba Oj Okc Pl Pn Tml Wac Wat

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture, Agricultural Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000 foot grid lines are approximate and based on the Georgia coordinate system, east zone

1 Mile

5 000 Feet

Scale 1:20 000

N

(Joins sheet 47)

840 000 FEET

715 000 FEET

(Joins sheet 55)

(Joins sheet 57)

705 000 FEET

820 000 FEET

(Joins sheet 64)

1 Mile

5 000 Feet

Scale 1:20 000

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

Vernonburg

Montgomery

Burnside

Pigeon Island

Rose Dew Island

Burnside Island

Marsh Island

SKIDAWAY ISLAND

ISLE OF HOPE

Jones Narrows

Long Island

Cedar Hammock

Wac Cc Oj Okc Ok El As Lp Tml Ojc Cx Mba Ch Lr Cm LQ Cuc Mae Mn

WHITE BLUFF ROAD

FERGUSON AVENUE

BACK RIVER

HOPE

ISLE OF

NARROWS

SKIDAWAY

RIVER

VERNON

FRIDAY CREEK

CAMP STRACHAN

SHIPYARD CREEK

HOUSTON CR

water

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service and the University of Georgia, College of Agriculture Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 57

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

845 000 FEET

715 000 FEET

705 000 FEET

865 000 FEET

(Joins sheet 48)

(Joins sheet 56)

(Joins sheet 58)

(Joins sheet 65)

57

N

1 Mile

5 000 Feet

Scale 1:20 000

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

N

(Joins sheet 49)

890 000 FEET

720 000 FEET

WILMINGTON ISLAND

HALFMOON RIVER

CUT

TYBEE

CABBAGE ISLAND

CABBAGE CREEK

BULL RIVER

TYBEE ISLAND

HOUSE CREEK

TYBEE CREEK

LITTLE TYBEE

Petit Chou Island

WASSAW SOUND

ATLANTIC OCEAN

(Joins sheet 57)

(Joins sheet 59)

705 000 FEET

870 000 FEET

(Joins sheet 66)

1 Mile

5 000 Feet

Scale 1:20 000

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 59

59

N

895 000 FEET

720 000 FEET

(Joins sheet 50)

(Joins sheet 58)

water

CREEK

TYBEE

LITTLE

TYBEE ISLAND

Tml

Ch

Klc

Cub

OCEAN

ATLANTIC

705 000 FEET

915 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

1 ¾ ½ ¼ 0

5 000 4 000 3 000 2 000 1 000 0

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins lower right)

744 000 FEET

680 000 FEET

675 000 FEET

741 000 FEET

(Joins sheet 67)

LIBERTY

Mount COUNTY

Hope Creek

JERICO R

Oj Cc Ok Ch Cx Pl Tml

3 000 AND 5 000 FOOT GRID TICKS

740 000 FEET

700 000 FEET

685 000 FEET

720 000 FEET

(Joins sheet 52)

(Joins sheet 61)

(Joins inset)

LIBERTY

Mount COUNTY

Hope Creek

SEABOARD COAST LINE

Oj Cc Ok Pl Waf Pn Cx As Mn

17 25

P

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 61

61

N

745 000 FEET

700 000 FEET

(Joins sheet 53)

(Joins sheet 60)

(Joins sheet 62)

(Joins sheet 67)

765 000 FEET

685 000 FEET

Scale 1:24 000

1 Mile

5 000 Feet

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000-foot grid lines are approximate and based on the Georgia coordinate system, east zone

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 62

62

N

(Joins sheet 54)

790 000 FEET

700 000 FEET

685 000 FEET

770 000 FEET

(Joins sheet 68)

(Joins sheet 61)

(Joins sheet 63)

Scale 1:20 000

1 Mile 0 1/4 1/2 3/4 1

5 000 Feet 0 1 000 2 000 3 000 4 000 5 000

Sterling Creek

STERLING CREEK

OGEECHEE RIVER

Ford Island AB

CHATHAM COUNTY
BRYAN COUNTY

Rabbit Hill

Port Royal ROAD

GEORGE DEVER ROAD

POPLAR ROAD

JOHNSON ADAM SWAMP ROAD

BORROW PIT

POPLAR SWAMP

Myrtle Grove

B.P.

Pl Oj Cx Pn Ok Cc Tmh Ch Tml El Waf As Ol LQ Mn

Photobase from 1970 aerial photography. Positions of 5 000 foot grid ticks are approximate and based on the Georgia coordinate system east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service and the University of Georgia College of Agriculture Agricultural Experiment Stations

63

N

795 000 FEET

700 000 FEET

(Joins sheet 55)

(Joins sheet 62)

(Joins sheet 64)

690 000 FEET

815 000 FEET

(Joins sheet 69)

Tml Tmh Ch Lp Pl Oj As

ROCKFISH CREEK

(GROVE RIVER)

(FOREST RIVER)

Rose Dew Island

Cm

LITTLE OGEECHEE RIVER

CHATHAM COUNTY
BRYAN COUNTY

OGEECHEE RIVER

CUT

HARVEY

HARVEYS CREEK

Fort McAllister

Savage Island

Shad Island

ISLAND

CHARLES CREEK

water

w

1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations
Photobase from 1970 aerial photography Positions of 5,000 foot grid lines are approximate and based on the Georgia coordinate system, east zone

N

(Joins sheet 56)

840 000 FEET

700 000 FEET

(Joins sheet 63)

690 000 FEET

820 000 FEET

(Joins sheet 70)

(Joins sheet 65)

Scale 1:20 000

1 Mile

5 000 Feet

Rose Dew Island

Possum Point

Burnside Island

Mae Island

BURNSIDE RIVER

PETIT GAUKE CREEK

CROOKED CREEK

VERNON RIVER

HAMMOCK ISLAND

CROOKED CREEK

Ella Island

LITTLE OGEECHEE RIVER

HARVEYS ISLAND

SKIDAWAY ISLAND

FRANKLIN CREEK

DELEGAL CREEK

Green Island

CRIMFIELD CREEK

CREEK

GREEN ISLAND SOUND

Tml Ch Ol Cm Lp Lr El Okc Cuc

Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 65

65

N

845 000 FEET

700 000 FEET

690 000 FEET

865 000 FEET

(Joins sheet 57)

(Joins sheet 64)

(Joins sheet 66)

(Joins sheet 71)

ISLAND

MARSHES

HABERSHAM CREEK

CHANNEL

OLD MARSH

ROMERLY ISLAND

ROMERLY CREEK

SKIDAWAY ISLAND

ADAMS CREEK

LITTLE WASSAW ISLAND

ODINGSELL RIVER

WASSAW CREEK

RHODES CREEK

CURTIS CREEK

Flora Hammock

Cm El Mba Lr Lp Ch Tml Kic

1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

(Joins sheet 58)

890 000 FEET

700 000 FEET

690 000 FEET

870 000 FEET (Joins inset, sheet 71)

(Joins sheet 65)

1 Mile

5 000 Feet

Scale 1:20 000

WASSAW SOUND

OCEAN

ATLANTIC

WASSAW ISLAND

CREEK

WASSAW

water

int

Tml Ch Kic Cub Om

Photobase from 1970 aerial photography Positions of 5,000-foot grid ticks are approximate and based on the Georgia coord nate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 67

67

N

745 000 FEET

680 000 FEET

765 000 FEET

670 000 FEET

(Joins sheet 61)

(Joins inset, sheet 60)

(Joins sheet 68)

(Joins sheet 72)

Cc Ch Cx Ok Oj Pl Pn Tml Waf Mba As El Ol Mn

MOUNT HOPE ROAD
LINE
COAST
SEABOARD
ISLAND ROAD
SHEEP
HIGHWAY 25
DEEP CREEK ROAD
FORDED
OLIVER ROAD
FIELD
WILLIS
WARREN
BILL
EGYPT ROAD
INTERSTATE
PROPOSED
CRANSTON ROAD

JERICO RIVER
LIBERTY COUNTY

1 Mile
5 000 Feet
Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 62)

(Joins sheet 67)

(Joins sheet 69)

(Joins sheet 73)

790 000 FEET

685 000 FEET

670 000 FEET

770 000 FEET

POPLAR SWAMP ROAD

PARK HILL ROAD

GEORGE OLIVER ROAD

WILLIAM SLIGE ROAD

DUNHAM SWAMP ROAD

GEORGE WASHINGTON CARVER SCHOOL ROAD

WOODLAWN ROAD

JAKE BROWN ROAD

George Washington Carver School

Bryan Neck Church

Bryan Neck Church

Keller

Oak Level

TIVOLI RIVER

Sweet Hill Creek

BORROW PIT

B.P.

Ol Oj El As Pl Mn LQ Ch Tml Ok Lp Cm Mba Lr Tmi

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture Agricultural Experiment Stations.

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 69

69

N

795 000 FEET

685 000 FEET

(Joins sheet 63)

(Joins sheet 68)

(Joins sheet 70)

815 000 FEET

670 000 FEET

(Joins sheet 74)

Shad Island

HARVEYS ISLAND

OGEECHEE — CHATHAM COUNTY — BRYAN COUNTY — RIVER

REDBIRD CREEK

CHARLES CREEK

REDBIRD ROAD

KING ROAD

SALE ROAD

COTTENHAM ROAD

BELVIDERE ROAD

BROWN LANE

OI CREEK

CREEK

NARROWS

FLORIDA PASSAGE

QUEEN BESS CREEK

Bear Island

OSSABAW ISLAND

Tml Ch Oj Pl Of Mba As El Cm Lp LQ Ol Lr

1 Mile

5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1970 aerial photography. Positions of 5,000 foot grid ticks are approximate and based on the Georgia coordinate system, east zone

70

N

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 64)

840 000 FEET

685 000 FEET

(Joins sheet 69)

(Joins sheet 71)

670 000 FEET

820 000 FEET

(Joins sheet 75)

CHARLES CR

CHARLES CREEK

HARVEYS ISLAND

Little Don Island

GREEN ISLAND SOUND

Hell Gate

OGEECHEE RIVER

RACCOON KEY

OSSABAW ISLAND

RUSH CREEK

CANE PATCH CREEK

Cane Patch Island

Egg Islands

ROAD

water

Tml

Ch

Lr

Lp

Ol

El

Cm

Kic

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, College of Agriculture Agricultural Experiment Stations, Soil Conservation Service, and the University of Georgia.

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 71

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

(Joins sheet 70)

845 000 FEET

685 000 FEET

(Joins sheet 65)

(Joins inset)

LITTLE WASSAW ISLAND

PINE ISLAND

ODINGSELL RIVER

CURTIS CREEK

WASSAW ISLAND CREEK

OSSABAW SOUND

ATLANTIC OCEAN

Tml Kic Ch Om Cub

(Joins sheet 66)

870 000 FEET

686 000 FEET

(Joins upper right)

684 000 FEET

872 000 FEET

2 000 FOOT GRID TICKS

670 000 FEET

865 000 FEET

71

N

1 Mile

5 000 Feet

Scale 1:20 000

N

765 000 FEET

(Joins sheet 67)

665 000 FEET

(Joins sheet 73)

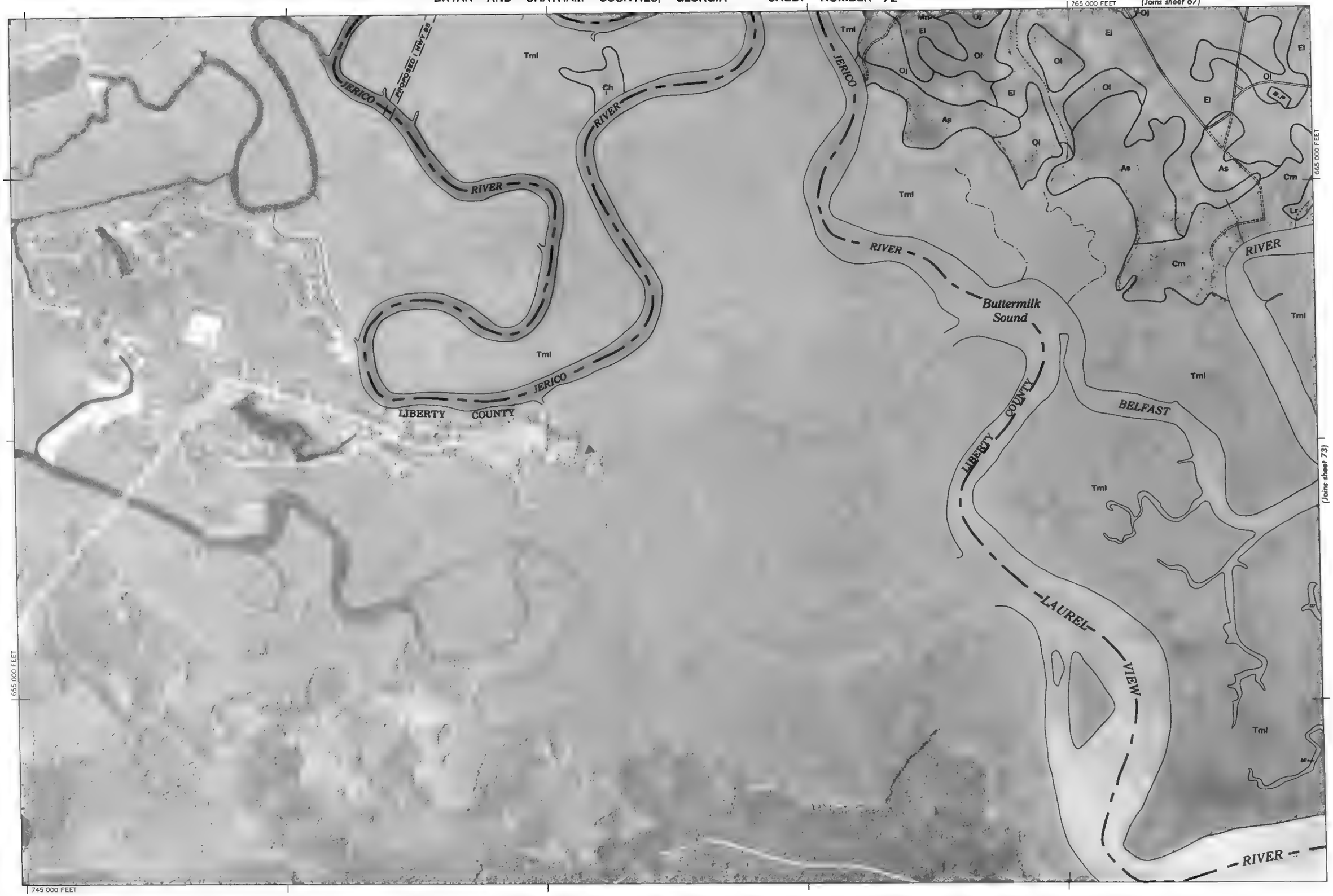
655 000 FEET

745 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000



Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

N

770 000 FEET

665 000 FEET

(Joins sheet 68)

(Joins sheet 72)

(Joins sheet 74)

655 000 FEET

790 000 FEET

(Joins sheet 76)

Belfast

B.P.

DUNHAM SWAMP RD.

Corinth Church

SHEPHERD FIELD ROAD

BROWN ROAD

SMITH ROAD

KILKENNY ROAD

REDBIRD CREEK ROAD

SLEW ROAD

SAMMY BROWN RD.

JAKE

Water

BELFAST RIVER

ITOLI RIVER

Dutchman Bay

LAUREL VIEW LIBERTY COUNTY RIVER

Ol Oj El Cm Lr Lp LQ Mn As Pl Tml Ch

1 Mile
5 000 Feet
Scale 1:20 000
1 000 0 0 1 000 2 000 3 000 4 000 5 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agriculture Agricultural Experiment Stations
Photobase from 1970 aerial photographs. Positions of 5 000 foot grid ticks are approximate and based on Georgia coordinate system east zone

N

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 69)

(Joins sheet 73)

(Joins sheet 77)

(Joins sheet 75)

815 000 FEET

665 000 FEET

695 000 FEET

795 000 FEET

FLORIDA — PASSAGE

BEAR — RIVER

ISLAND

CREEK

JONES SWAMP ROAD

SMITH ROAD

KILKENNY ROAD

B.P. ROAD

CANE PATCH CREEK

BUCKHEAD CREEK

TOM CREEK

BIG TOM CREEK

LITTLE OSSABAW

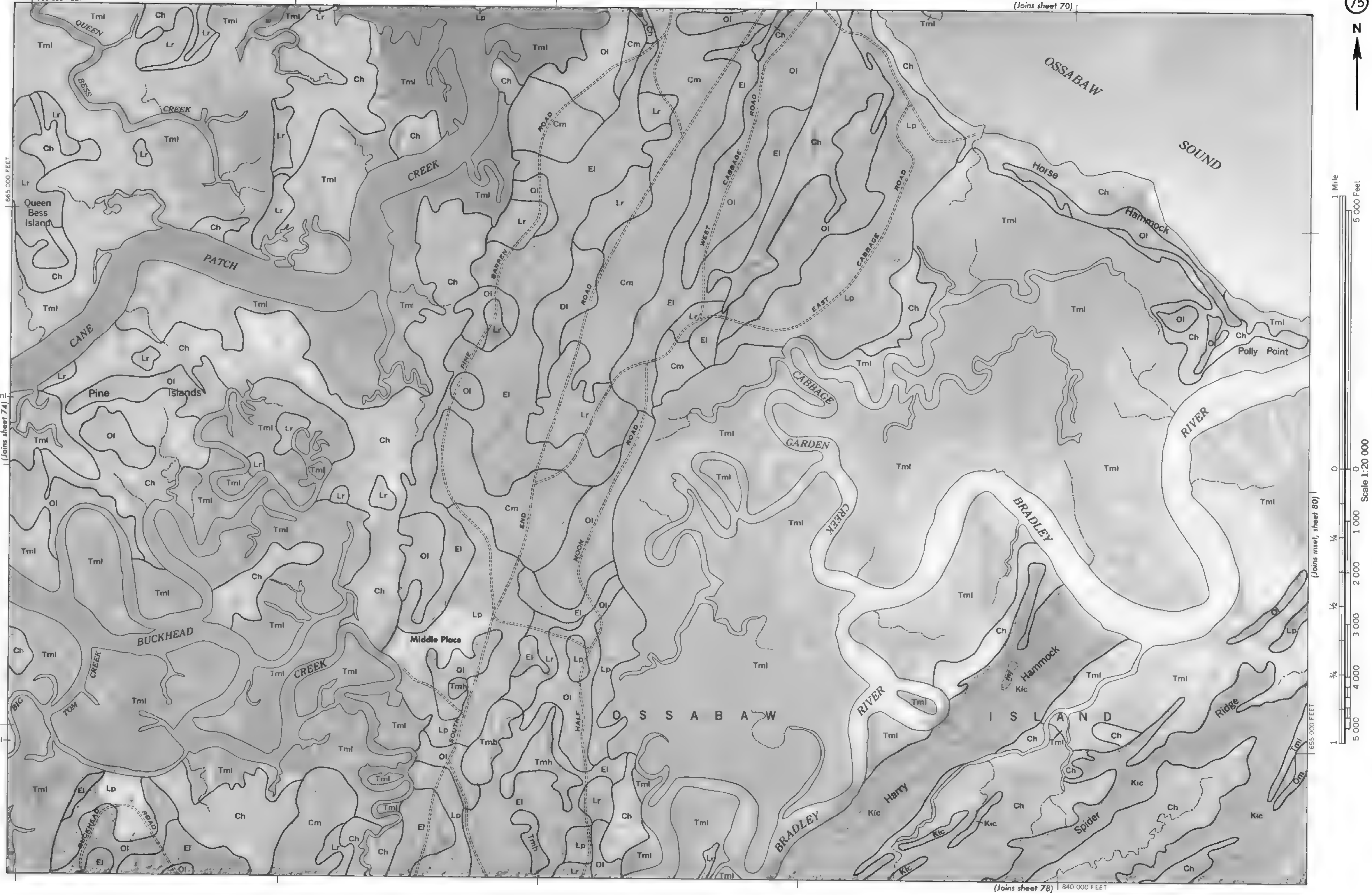
KILKENNY

BRYAN COUNTY
CHATHAM COUNTY

Ol Lr El LQ Cm Ch Tml Lp Pl

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agricultural Experiment Stations



This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

N

1 Mile

5 000 Feet

0 0

Scale 1:20 000

¼ 1 000 2 000

½ 3 000

¾ 4 000

1 5 000

(Joins sheet 73) | 790 000 FEET

650 000 FEET

640 000 FEET

775 000 FEET

(Joins sheet 77)

SAMMY BROWN ROAD

BELLE ISLE ROAD

LINCOLN CREEK

DEMERIES CREEK

LIBERTY COUNTY EAST CHANNEL

MEDWAY RIVER

FANCY HALL CREEK

RETREAT CREEK

Fancy Hall

Belle Isle

Tml Lp Cm Ol El Lr Ch LQ

Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

BRYAN AND CHATHAM COUNTIES, GEORGIA — SHEET NUMBER 77

77

N

795 000 FEET

1 650 000 FEET

640 000 FEET

820 000 FEET

(Joins sheet 74)

(Joins sheet 76)

(Joins sheet 78)

(Joins sheet 79)

KILKENNY CREEK

LINCOLN CREEK

CUBBAGE CREEK

JONES HAMMOCK CREEK

MEDWAY RIVER

BEAR RIVER

BRYAN COUNTY

CHATHAM COUNTY

BIG TOM CREEK

OSSABAW ISLAND

NEWELL CREEK

SOUTH END LOG ROAD

SOUTH BEACH ROAD

Cubbage Island

Belle Isle

water

Cm Ch El Kic Lp Lr Ol Tml w

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

78

N

(Joins sheet 75)

845 000 FEET

(inset, 80)

650 000 FEET

640 000 FEET

820 000 FEET

(Joins sheet 80)

(Joins sheet 77)

Scale 1:20 000

1 Mile — 5 000 Feet

0 — 0

¼ — 1 000

½ — 2 000

¾ — 3 000

1 — 4 000 — 5 000

OSSABAW ISLAND

ATLANTIC OCEAN

Ocean Pond

Pelican Point

BRADLEY RIVER

NORTH BUCKHEAD ROAD

BUCKHEAD ROAD

SOUTH BUCKHEAD ROAD

SOUTH END ROAD

MAIN ROAD

BEACH ROAD

BRADLEY BEACH ROAD

SOUTH BEACH ROAD

LOG HOLE ROAD

HELL ROAD

MIDDLE RUN ROAD

Tml Ol El Lr Ch Lp Cm Tmh Kic Om Cub

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

800 000 FEET

635 000 FEET

(Joins sheet 77)

(Joins sheet 80)

620 000 FEET

820 000 FEET

79

N

1 Mile

5 000 Feet

Scale 1:20 000

JONES CREEK

HAMMOCK

MEDWAY RIVER

BEAR RIVER

OSSABAW ISLAND

Cub

BRYAN COUNTY

CHATHAM COUNTY

LIBERTY COUNTY

ST CATHERINES SOUND

Tml

Ch

Kic

N

(Joins sheet 78)

845 000 FEET

635 000 FEET

850 000 FEET

665 000 FEET

OSSABAW SOUND

Bradley Point

OSSABAW ISLAND

CREEK

CAMP

OCEAN

ATLANTIC

Tml

Ch

Kic

Cub

Om

Lp

(Joins sheet 79)

(Joins sheet 75)

655 000 FEET

620 000 FEET

825 000 FEET

845 000 FEET

(Joins sheet 78)

1 Mile

5 000 Feet

Scale 1:20 000

1 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

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